OCTOBER 1957

products finishing

FINISHES ON METAL PRODUCTS

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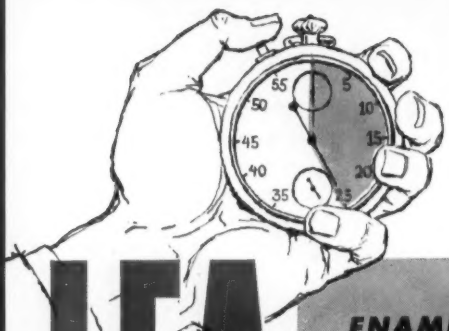

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ENAMEL, LACQUER and SYNTHETIC COATING STRIPPERS —plus Lea Compounds—have contributed much to the organic finishing field

You know about the many Lea Compositions, both solid and liquid, that are doing such an excellent job of Burring, Buffing & Satin Finishing metal, plastic and wood surfaces.

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- **LEA COLDSTRIP . . . non-toxic stripper used at room temperature; only minimum ventilation; can be filtered for continued recirculation.**

While Synstrip and Coldstrip do similar work, the choice depends upon volume of work, operating conditions, ventilation facilities, etc. We suggest that you outline your set-up and let our technical staff recommend which of the two would be better for your stripping requirements.

Burring, Buffing, Polishing, Lapping, Plating and Spray Finishing . . . Manufacturers and Specialists in the Development of Production Methods, Equipment and Compositions. Manufacturers of Lea Compound and Learex . . . Industry's quality buffing and polishing compounds for over 30 years.

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3	19	35	51	67	83	99	115	131	147	303-4th Cov.	332	348	364	380	396	412	428	444
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6	22	38	54	70	86	102	118	134	150	306	319	335	351	367	383	399	415	431	447
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8	24	40	56	72	88	104	120	136	152	308	321	337	353	369	385	401	417	433	449
9	25	41	57	73	89	105	121	137	153	309	322	338	354	370	386	402	418	434	450
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15	31	47	63	79	95	111	127	143	159	315	328	344	360	376	392	408	424	440	456
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14	30	46	62	78	94	110	126	142	158	314	327	343	359	375	391	407	423	439	455
15	31	47	63	79	95	111	127	143	159	315	328	344	360	376	392	408	424	440	456
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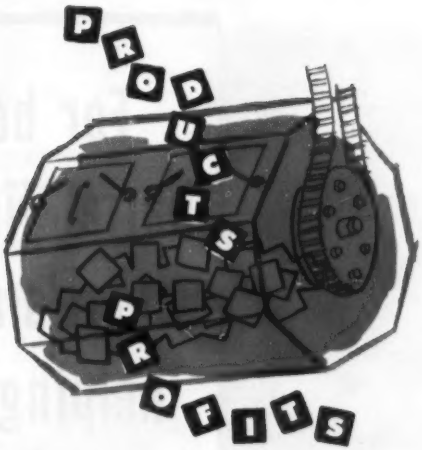

Here's an exciting new game:

PUT your products in the barrel
TAKE your profits out

One of the greatest money-saving opportunities in metal-working lies in the use of barrels to finish parts by the hundreds in place of conventional methods that finish one part at a time.

Barrel finishing makes easy work of many tough jobs of grinding, deburring and buffing by wheel.

One Oakite customer changed to barrel methods to deburr curved stainless steel strips that are 14 inches long. The cost for deburring 20,000 strips was reduced from $3,000 to $125.00.

FREE For a copy of *"Precision Barrel Finishing"*—containing valuable information on cutting down, deburring, descaling, and burnishing—write to Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

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For better barrel finishing ...here's a real helping hand

Improved ALUNDUM TUMBLEX* "A" abrasive brings you many new "Touch of Gold" advantages*

The new Norton TUMBLEX "A" abrasive has exceptionally long life . . . great resistance to wedging in work-piece crevices . . . adds attractive lustre . . . and can handle the widest variety of parts.

It performs several operations at once — removing flash, scale, tool marks and burrs, while forming radii and finishes to the required microinch. It is also better sized, more uniform in shape and available in a wider range of sizes.

SIZES NOW AVAILABLE

No.	Size	No.	Size
00	1½" to 2"	3½	5/16" to 3/8"
0	1" to 1½"	4	1/32" to 5/16"
1	3/8" to 1½"	5	3/16" to 1/4"
1½	1/16" to 3/8"	6	1/8" to 3/16"
2	5/16" to 3/4"	8	1/32" to 1/8"
2½	1/2" to 5/16"	10	standard 10 mesh
3	3/8" to 1/2"	12	standard 12 mesh

Every one of these sizes has advantages that will increase product value and cut the costs of general barrel finishing. That's how the improved TUMBLEX "A" *abrasive will step up your profit-boosting "Touch of Gold" to a new high.*

Send Your Work Samples to our enlarged Sample Processing Department — and include a finished piece. We will barrel finish the samples with new TUMBLEX "A" abrasive — or any Norton tumbling abrasive that may be more suitable — and explain how you can improve finishing operations. NORTON COMPANY, *General Offices,* Worcester 6, Mass. Plants and distributors around the world.

G-331

NORTON
ABRASIVES
Making better products... to make your products better

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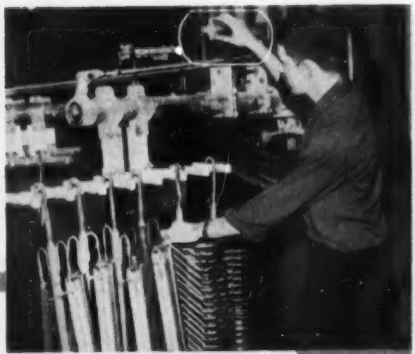
Now

automate many different finishing operations simply in one ANODIZING or ELECTROPLATING machine!



Operator sets DIAL-A-CYCLE on automatic anodizing machine in leading refrigerator parts plant. Carrier automatically by-passes or lowers parts into tanks as the dial setting dictates.

just set a dial... H-VW-M DIAL-A-CYCLE does the rest!

If you anodize or electroplate a number of different parts, each requiring a different *treatment* . . . *finish* . . . or *color*—these many separate operations can be automated in one multiple-finish conveyor with H-VW-M's remarkable new DIAL-A-CYCLE.

HERE'S HOW IT OPERATES. As racked parts are loaded on each carrier arm, a dial on the carrier is set for the particular cycle the load is to go through. Automatic conveying does the rest, lowering parts into the proper tanks, by-passing others, according to the dial setting.

As simply as that, unusual savings are realized in production time . . . labor . . . capital investment. Like to know more? Write today for facts about how DIAL-A-CYCLE can go to work in your plant! **Hanson-Van Winkle-Munning Company, Matawan, New Jersey. Offices in principal cities.**

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PLATEMANSHIP—Your H-VW-M combination—of the most modern testing and development laboratory—of over 50 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

Industry's Workshop for the Finest in Plating, Anodizing, and Polishing Processes • Equipment • Supplies

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SAVING TIME

Enthonics AT WORK

25 seconds from immersion to completed stripping!

That's the fast, dramatic story of ENTHONE Enamel Stripper S-18 in action — another example of *Enthonics* at work.

Enthone Enamel Stripper S-18 is the modern organic stripper developed for removing the newest organic finishes such as Epon or Epoxy coatings and many synthetic enamels from copper, copper alloys, steel and aluminum.

For the right strippers to solve your organic stripping problems fill out a questionnaire we'll send at your request; return it with typical samples of your work. Enthonics will find the answer . . . without obligation!

And ask for your copy of the "Enthone Check List" of literature covering more than 60 products and processes developed for modern electroplating and metal finishing.

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products finishing

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POLISH any shape ALUMINUM

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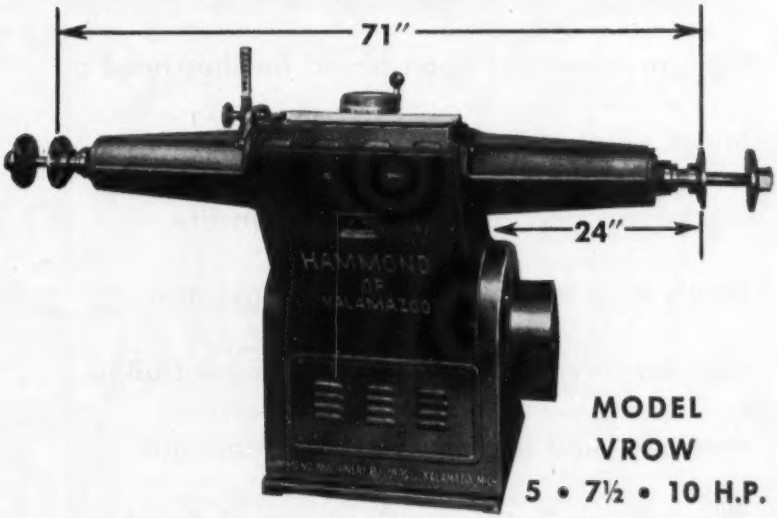

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Ideal for bulky parts. Spindle overhang and extended bearing housings enable two operators to work without interfering with each other.

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Modern epon and epon-based finishes need a tough paint stripping compound that works fast and gives long solution life. That's why many of the world's greatest manufacturers of consumer goods use DuBois specially built paint stripping compounds. They rely on DuBois service to get their job done fast and economically.

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i'so-brite® [Proprietary Name] Plating addition agents which produce plating of uniform brightness.

wagner i'so-brites®—The plating chemical line with

THE BIG PLUS

And that BIG PLUS is the advantage of one source, one responsibility. If you buy plating or influence plating specifications — or carry heavy cost responsibilities in a plant which turns out a plated product, you may be well aware of the tendency to hop-scotch around from one proprietary plating solution to another. Why? You're searching for uniform high quality, low cost, ease of operation — but above all, one responsibility at the source. And until the Wagner ISO-BRITE proprietaries were introduced, that one responsible source did not exist.

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And speaking of THE responsible source, the combination of ISO-BRITE proprietaries and Wagner anodes, rectifiers and automatic or still tank equipment, backed up by Wagner engineering and service, means better quality, fewer service headaches, more profit. Call the Wagner man in your area or write.

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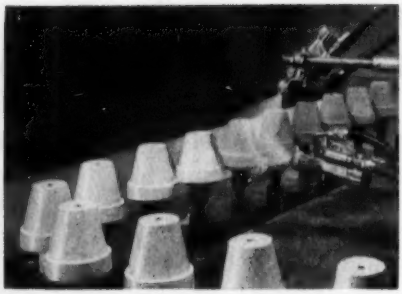

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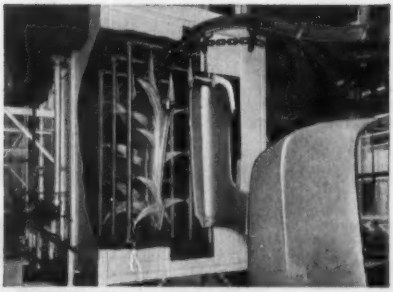
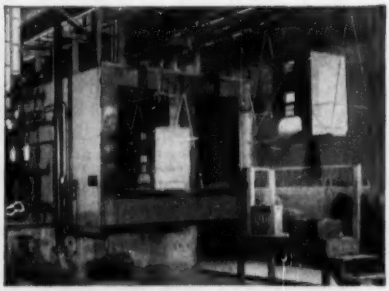
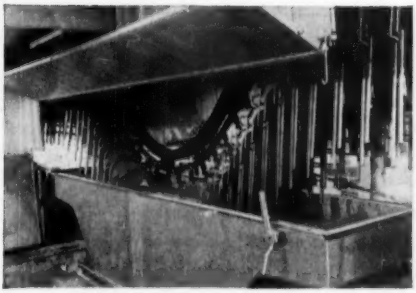
NOW! DeVilbiss builds all major types of finishing equipment



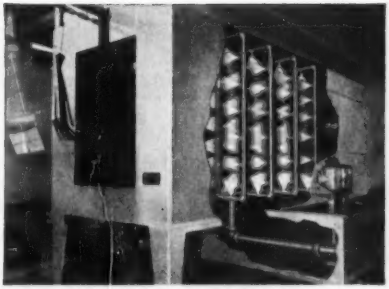
Flo-Coaters



Multi-Stage Metal-Treating Units



Dip Coaters



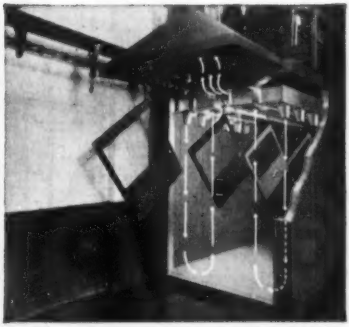
Parts Washers

Now, through its new subsidiary—the Newcomb-Detroit Company – DeVilbiss emerges as the only "one-source" company that designs, manufactures and installs complete systems for all major types of finishing operations.

For large, diversified finishing departments, this means matched equipment for fully integrated systems, with performance guarantee a "one-source" responsibility.

For specialized shops or operations, it means you can select units of any kind or capacity for whatever method best suits your needs.

So, when planning to build, revamp, or supplement your finishing department, call DeVilbiss—the one-source supplier of all major finishing equipment.



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Cleaning-tank sizes from one pint to seventy-five gallons for batch and conveyorized cleaning.

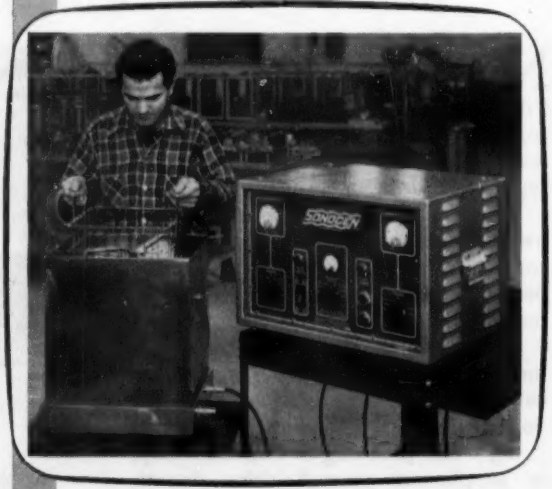
Maximum cleaning efficiency.

Rugged, simple construction for long trouble-free life.

Advanced design based on a decade of manufacture and use of ultrasonic equipment.

Modest investment, low operating and upkeep costs.

Ultrasonic energy has been used for years for rapid, thorough cleaning of sterling, plated and stainless flat and hollow ware, builders' hardware, castings, strip, electrical and electronic components, etc.



The Sonogen® Model APT-100B is used extensively for pickling and removal of rouge, tripoli and investment-casting materials, prior to plating.

BRANSON ULTRASONIC CORPORATION

26 BROWN HOUSE ROAD, STAMFORD, CONN.

Write or phone DAvis 4-6721 for a demonstration at your plant.

year after year, you get
BALANCED QUALITY*
in
MICCROSOL

Developed originally as a coating for plating racks, Miccrosol E-1003 has all the desirable characteristics which make it an ideal coating for many other applications.

The chemical resistance of Miccrosol is unequalled in its field. Its toughness, abrasion resistance, resilience, and flexibility are unsurpassed. It's easy to apply in either a *dip* or *spray* formula. When necessary, it's easy to repair.

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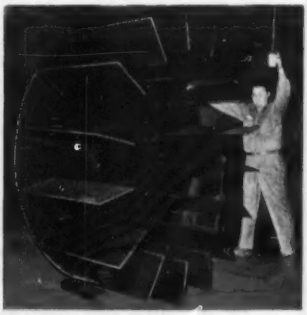
This BALANCED QUALITY enables you to use Miccrosol *profitably* while assuring your customers of coating jobs that will prove superior in their performance.

**Outstanding performance and value*



MICCRO Products

Developed and manufactured by experienced platers and coaters

The above illustrations show Miccrosol being used as a coating: At the left, Miccrosol Spray S-2003 is being applied to a large plating tank. At the right, Miccrosol E-1003 has been applied by dipping this large paddle. Contact us for the name of the qualified Miccrosol coater nearest you.

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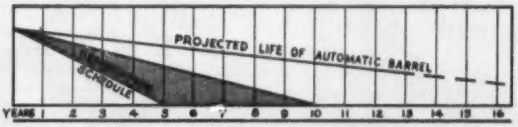
A HOT IDEA FOR COOL PROFITS

THE FINISHING TOUCH

by A. B. HOEFER
Vice-President
FREDERIC B. STEVENS, INC.

Stevens Automatic Plating Barrels Adaptable to Any Situation

IT'S GOOD TO KNOW WHEN YOU ARE INVESTING in a plating machine that Stevens units can be designed so that more than one type of plating can be done on one machine. Also, that changes can be made in the future to meet any specifications you may have. We've changed over a good number of Stevens machines in our time. That's why there are so many Stevens machines in use far beyond their depreciation schedule.



THERE ARE MANY OTHER SAVINGS you can enjoy beyond long life. Stevens Automatic Barrel machines require only one employee to operate the machine. These units are completely automatic, because the open end barrel is loaded when in a vertical mouth-upward position and automatically unloaded by tilting the barrel downward. There are no lids to fasten or unfasten.

POSSIBLE MIXING OF PARTS IS ELIMINATED in the Stevens automatic barrel. Small, special loads can be conveniently run without penalizing the productive capacity of the machine and without the inconvenience of partitioned cylinders. Stevens Automatic Barrel Machines are used for varied processes that include copper strike; copper, nickel, tin, brass, zinc and cadmium plating; phosphating; alrocing; dichromating; cleaning and bright dipping.

THE SIMPLE COMPACT DESIGN of this machine permits production capacities as high as 4,000 pounds per hour. Simplicity of design makes it equally practical to distribute the capacity between two or more machines to provide flexibility in plating thicknesses and production.

Let us give you more details on Stevens Automatic Barrels. Write us today, Frederic B. Stevens, Inc., 1814 Eighteenth Street, Detroit 16, Michigan.

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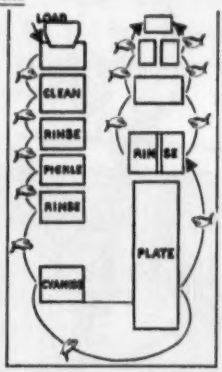
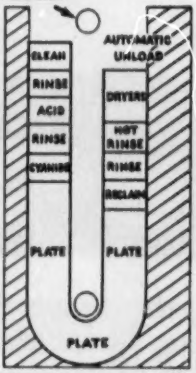
HOW AUTOMATIC BARREL PLATING CAN REDUCE YOUR HANDLING AND BURDEN COSTS—

Compare this
Conventional Horizontal Barrel Line



With this
Stevens Automatic Barrel Installation



Production from *both* installations is the same.

Notice how many more handling steps (indicated by the illustrated hands) and manual load-unload operations (indicated by the arrows) are required for the manual set-up.

Notice, too, how much floor space (indicated by shaded area) is saved with a Stevens automatic installation. No manual operations required with automatic load and unload.

For more data circle **315** on Reader Service Card

IBM relies on RANSBURG NO. 2 PROCESS Electrostatic Spray Painting

to get the excellent and uniform high quality wrinkle finish on all

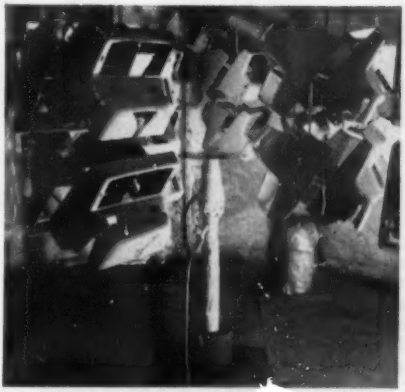
IBM ELECTRIC TYPEWRITERS

IBM's strict quality standards are easily maintained with Ransburg No. 2 Process in the painting of Electric Typewriter parts. Rejects by the former hand spray method used to run as high as 30% on some parts. Now, with automatic Electro-Spray, rejects for all reasons are only 3% to 5%.

Three Times as Many Pieces per Gallon!

Along with increased production, paint mileage is stepped up, and they get three times as many pieces per gallon as by the former hand spray method. That's because efficiency of the Ransburg No. 2 Process Reciprocating Disk puts the paint where it's supposed to go . . . on the parts.

Want to know how Ransburg Electro-Spray can improve the quality of your painted products . . . and at the same time, cut your paint and labor costs? At no obligation to you, we will make complete laboratory tests with your products to prove the advantages and cost saving benefits which can be yours with Ransburg No. 2 Process. Write or call.



Both prime and finish coats are uniformly applied to IBM Electric Typewriter cases as they rotate around the floor-mounted Ransburg No. 2 Process reciprocating disks. Automatic Electro-Spray provides three times as many pieces per gallon as by former hand spray.

Ransburg ELECTRO-COATING CORP.

Indianapolis 7, Indiana

RANSBURG

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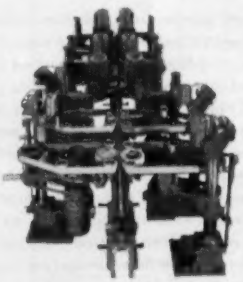
Quality

is consistent when you polish and buff

the *Acme* way!

Acme can build you a polishing and buffing machine to turn out part after part on schedule, and always with the same high quality of finish.

Unusual contours or surface conditions won't stop Acme's specialized engineering talent — they'll build an automatic operation to handle it faster and cheaper. Maybe lack of space is your problem— Acme engineers working with flexible Acme standard units can often add to the number of operations on a single machine and eliminate the need for additional machines on the line. Or perhaps redesigning the indexing cycle to add more polishing or buffing heads on an existing machine can speed up production. Whatever your polishing and buffing problem is, the Acme man can help you.

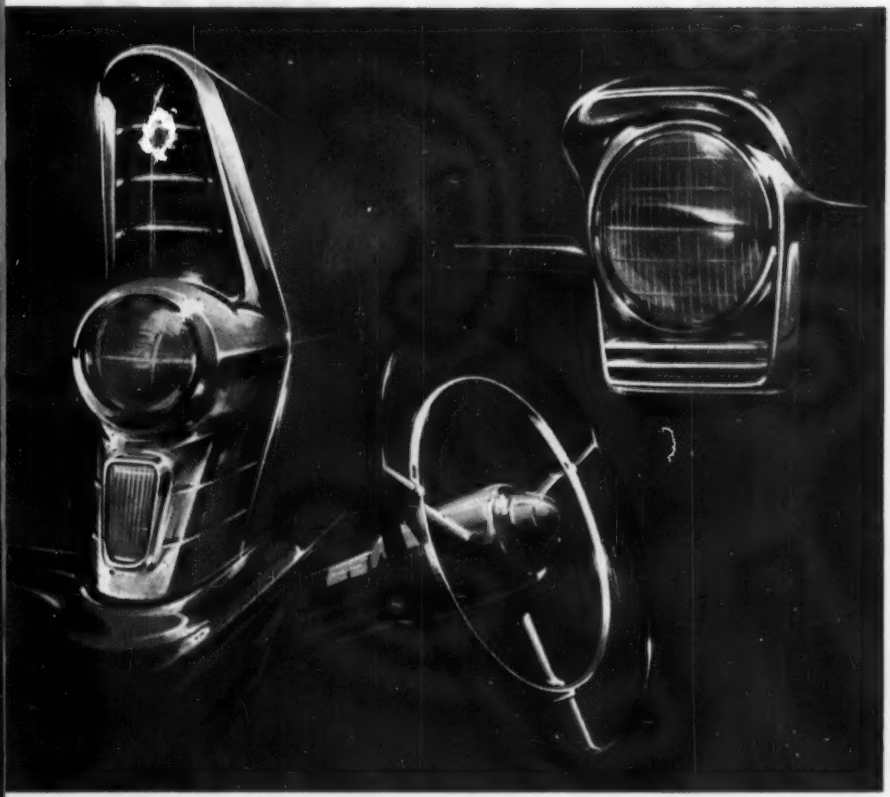


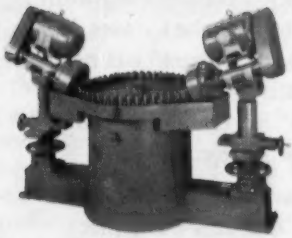
This Acme automatic straight-line machine completely polishes and buffs 1,400 pieces per hour. Four Acme G-3 belt polishing heads with floating back-up wheel and vertical oscillation are followed up by eight Acme G-3 buffing lathes.

LET ACME *Polish Off* YOUR FINISHING PROBLEMS

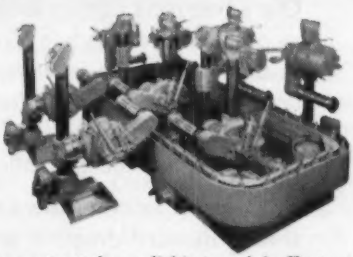
ACME MANUFACTURING COMPANY

LEADING PRODUCERS OF AUTOMATIC





High volume can be put through this setup, for spot face grinding valve rocker arms. This Acme 36-inch continuous rotary table, with grinding wheel heads having cup wheels, can be quickly adapted to a variety of small castings.



Acme rectangular polishing and buffing machine with eight Acme heavy-duty adjustable floating head lathes equipped with 24" cartridge type spindles. Production can run several thousand pieces per hour.

1400 E. 9 MILE ROAD, DETROIT 20, MICHIGAN

HING AND BUFFING EQUIPMENT SINCE 1910

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GOOD OPERATION

Cowles NS cleaner first... then barrel plating!

Our advertising agency looked in on this job plating shop with us one day and it didn't take a spyglass to find the Cowles NS drums. And it's no wonder, because this large plater* has been ordering NS and other Cowles cleaners by the truckload for years. He says NS speeds his operation . . . cleans the tough jobs as well as the easy ones . . . eliminates rejects.

As an extra convenience to truckload customers, Cowles ships palletized drums if requested . . . 4 drums per pallet.

*Metal Finishers, Inc., Cleveland, Ohio

Cowles **CHEMICAL COMPANY**

7016 Euclid Avenue • Cleveland 3, Ohio

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OCTOBER, 1957

editorial

CLEANING — An Integrated Process

Today the metal finisher has at his disposal a wide variety of metal cleaners specially designed for many different cleaning jobs. These cleaners contain the proper combination of active cleaning materials, buffers, wetting agents, emulsifying agents, and other chemicals so that an efficient cleaning job is obtained without staining or etching the metal being cleaned. Most finishers recognize the importance of these cleaners which add so greatly to the efficiency of a finishing operation.

Not so well recognized, perhaps, is the fact that the entire cleaning cycle or cleaning process should be designed and specified as carefully as the individual cleaning compound or compounds. Each step of the finishing process is dependent on the preceding operation or operations, and this is equally true of cleaning cycles. Since rejections of finished products can often be traced to improper cleaning, the cleaning cycle must be considered as an integral part of the finishing process.

Complete and efficient removal of buffing compound from die castings prior to plating may require: 1. spray washing, 2. soak cleaning, 3. electrolytic cleaning. Better, faster cleaning of sheet metal prior to porcelain enameling can result from the use of a mechanical spray washer to remove drawing compound immediately after forming. Metal parts to be paint finished are sometimes routed through a vapor degreaser prior to spray cleaning and phosphatizing. It may be profitable to employ ultrasonic cleaning at some point in the cleaning or finishing cycle. These few examples merely indicate that cleaning cycles and materials should be carefully selected according to the surface soils to be removed, desired speed of process, cost, and other factors.

The cleaning industry has come of age! Today's manufacturer of cleaning materials and equipment offers the customer an engineered cleaning process cycle—not just a tank and a "barrel of caustic."

Ezra A. Blount

—EDITOR

Painting Automotive Window Frames

New plant's conveyorized installation does it quickly and efficiently.

By GERARD H. POLL, JR.
Associate Editor

products feature finishing

PRODUCING AUTOMOTIVE WINDOW FRAME UNITS IN QUANTITY—that's the job for which a new plant in North Vernon, Indiana, was built. This installation at North Vernon Industries, Inc., is equipped to paint window frames by a continuous conveyorized process that is almost totally automatic.

A Richards-Wilcox Zig-Zag overhead conveyor, 1,125 feet long, carries the parts through cleaning, dry-off, electrostatic spray painting, hand reinforcing, and baking operations.

Workers load three door frames onto each of the specially designed conveyor racks. The racks are spaced at 4½-foot centers on the conveyor, which can be set to travel at six to 12 feet per minute. (Fig. 1)

The first step in the finishing process, after loading, is cleaning. The conveyor carries the parts into an enclosed, three-stage tunnel washer. This spray washer, (Fig. 2) as well as the dry-off oven, spray booths, and baking oven, were installed by the W. C. Grant Company, Inc., Indianapolis, Indiana. The frames are sprayed with a hot solution of Diversey No. 519 cleaner (1½ oz./gal.), and then spray rinsed twice. Solutions in the washer are heated by immersion burners using "bottled" propane gas fuel.

The cleaned, wet parts travel through an open-end dry-off oven, which evaporates any water remaining on the parts, so that they are dry before paint is applied. Emerging from the drying chamber, the frames are wiped with Bond tack cloths to remove loose particles that might cause blemishes in the painted surface.

After traveling through a space

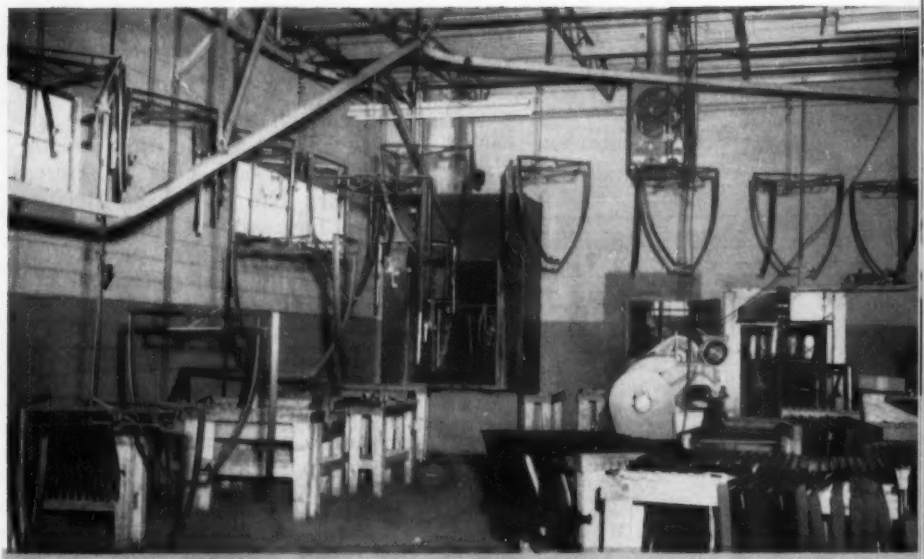
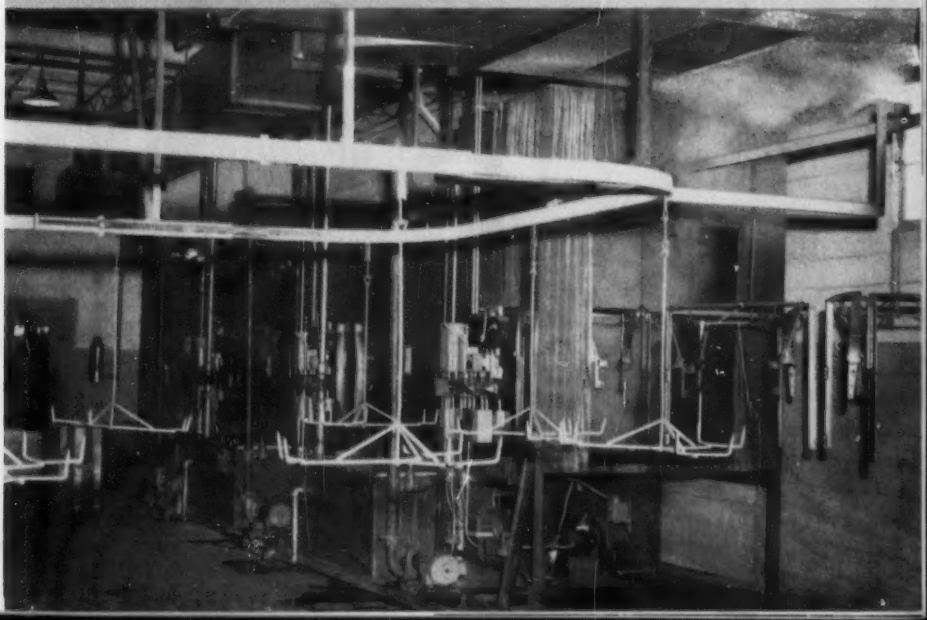


Fig. 1—Automobile window frames entering a three-stage washer (center background). Loading and unloading area is on the left. Parts on conveyor (right) have been painted, are ready to be unloaded. Finished parts are racked for sub-assembly (lower right).

Fig. 2—Parts on the right of this photograph are emerging from the spray washer and will now go into dry-off oven. The loop of conveyor in the foreground is to allow primed parts to "set up" before being sprayed electrostatically with the finish coat enamel.



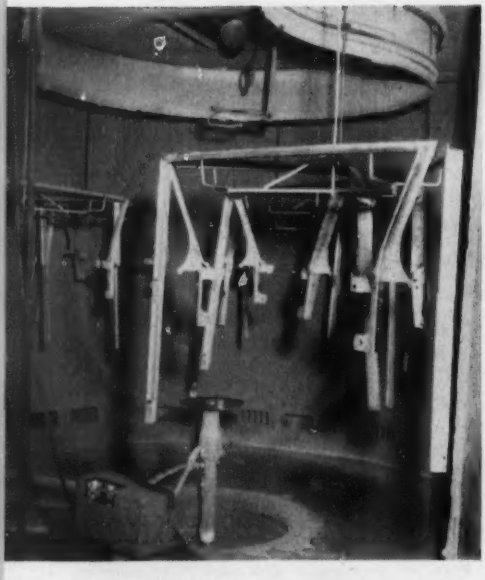
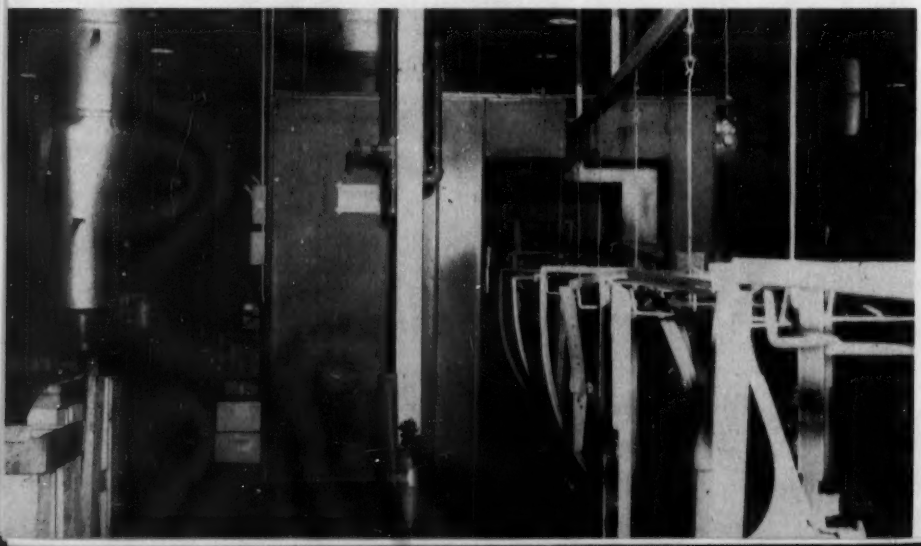


Fig. 3—Primer being applied in the first electrostatic booth. Electrostatic disc is in center of the photograph. The device that makes racks rotate as they go through the booth can be seen at upper right center. Slots near the bottom of the booth are exhaust ducts.

long enough to cool the parts, the conveyor enters the first electrostatic spray booth (Fig. 3). Here a Ransburg No. 2 Process Reciprocating Disc applies Jones-Dabney primer. This type of electrostatic paint-spraying system consists of a charged (90,000 volts) rotating disc with a hole in the center through which paint is fed. By centrifugal force, the paint moves to the edge of the disc and flies off, breaking up into a spray of electrostatically charged particles. Since the parts on the conveyor are grounded, the paint particles are attracted to the parts as the conveyor carries them through.

To cover the entire length of the parts, the disc moves up and down (hydraulically) from a pit in the floor. The length of the stroke it makes (which can be varied) is approximately the same as the length

Fig. 4—View of the first reinforcing booth, showing exhaust ducts behind the booth. Parts shown on conveyor have been primer coated electrostatically and reinforced with finish coat.



of the window frames hanging on the conveyor. Each rack on the conveyor is equipped with a small wheel that contacts a metal track to ground the parts during the time the racks are passing through the electrostatic booths; this device also rotates the racks while the parts are being painted, so that parts are evenly sprayed on all sides.

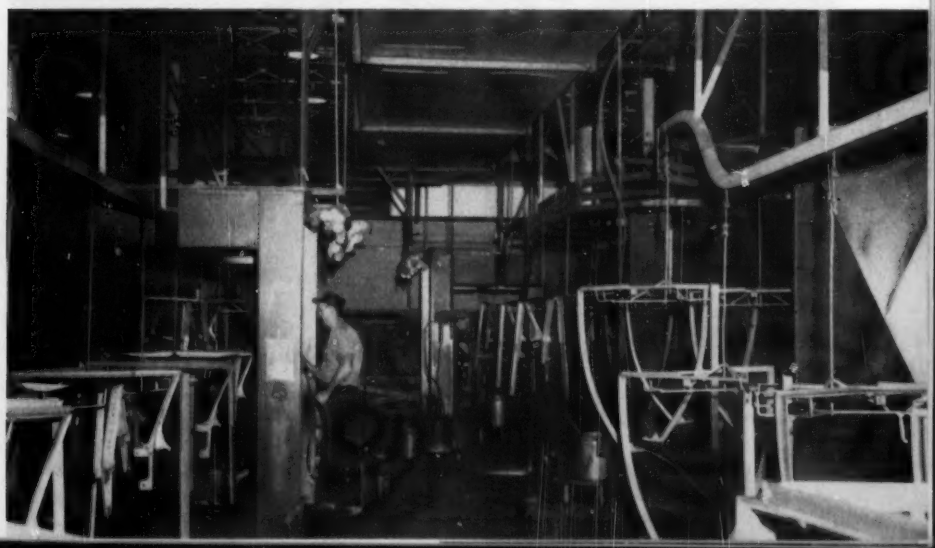
Parts next enter a hand-spray booth (Fig. 4), where an operator sprays them with Jones-Dabney finish-coat synthetic enamel. This operation is performed to reinforce areas that are difficult to reach with electrostatic spray. Parts then travel in the open on the conveyor (Figs. 4 and 5) for approximately eight minutes to "flash off" solvents from the initial coats.

The window frames wind through two more electrostatic booths (Fig. 5) identical to the one described previously; finish coat synthetic enamel is applied in both of these booths. In another hand-spray booth (Fig. 5), window frames are hand-spray-reinforced in areas that are hard to reach, such as depressions and corners. This completes a painting process in which ½ mil of primer and one mil of synthetic enamel have been applied.

All spray booths are exhausted into stacks immediately behind the booth walls (Fig. 4). The hand-spray booths are equipped with Research Products dry disposable filters to remove overspray paint particles from the air stream before exhausting the fumes. Electrostatic booths have exhaust ducts in the walls near the floor.

The plant is equipped with a filtration system that can be used to filter all incoming make-up air and keep the finishing room under positive pressure. Thus far it has not been necessary to use this system—the air has been free enough of impurities to permit the application

Fig. 5—Painting area: first reinforcing booth, left; electrostatic primer booth is behind it; two more electrostatic booths and touch-up booth, right. Ventilating duct is above.



of a high-quality finish without filtering the air.

After traveling through a set-up area to flash off solvents, the parts are baked in a "bottled" propane-gas-fired, hot-air convection oven. Baking time: 18 minutes at 325 deg. Fahrenheit.

Painted, baked window frames leave the finishing room at a point near that where they entered.

The conveyor circles overhead outside the finishing room to permit the finished metal parts to cool. It then descends to floor level for unloading of finished parts and reloading with parts to be cleaned and painted.

Window frames are unloaded in the same general area used for loading the conveyor. After unloading and inspection, the frames are racked, packed, and shipped to the automotive assembly plant where they will be joined with other sub-assemblies to form completed doors.

★ ★ ★

Outdoor Storage Tanks Protected by Vinyl Coating

W. R. Grace & Co. has found that vinyl coatings give good service in protecting outdoor storage tanks filled with ammonium hydroxide.

The tanks, which are 10½ feet in diameter and 53 feet long, were first

Fig. 6—Parts leave baking oven, then ride on conveyor long enough to cool before unloading. Fuel used to heat oven is "bottled" propane gas. (PRODUCTS FINISHING Photos)

sandblasted to give a clean surface for the paint application. The first coat was applied by brush, and three additional coats were applied by spray to give a total film thickness of 0.006 to 0.008 inch. Extra coats were applied to welds, corners and rough areas to be sure that every surface was thoroughly covered. A white top coat was used to reflect the sun's rays and minimize vaporization of ammonia in the tanks.

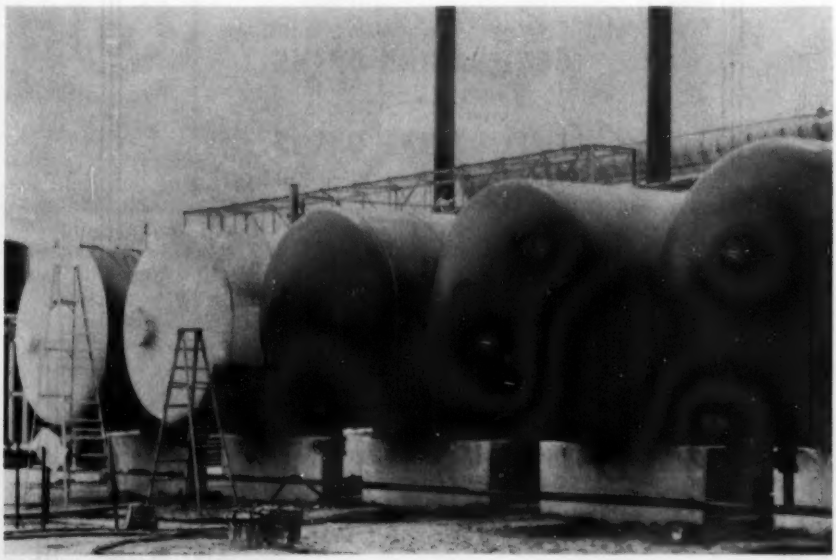
The coating used is Amercoat No. 33, a coating formulated by Amercoat Corporation, South Gate, California, based on vinyl resins made by Bakelite Company, a Division of Union Carbide Corporation.

W. R. Grace & Co. reports that this coating has protected the tanks for more than three years, and has shown excellent resistance to acids, alkalies, oils, weathering and abrasion. Since vinyl-based coatings require little time for application, the operation was completed quickly.

★ ★ ★

MOVIE ON ALUMINUM FINISHING. A 16 mm sound film — titled "Aluminum Finishing" has been completed by Turco Products, Inc. It is available for free showing to industrial concerns, technical groups and other interested organizations. The film, which is intended primarily for training purposes, visually demonstrates every aspect of aluminum finishing from pre-cleaning prior to conversion coating to painting and final assembly.

Additional information may be secured by writing to **Turco Products, Inc.**, 6135 S. Central Ave., Los Angeles 1, Calif.



These tanks, used to store ammonium hydroxide, are painted with a coating based on vinyl resins. Coating has given excellent protection against weather and corrosive chemicals.

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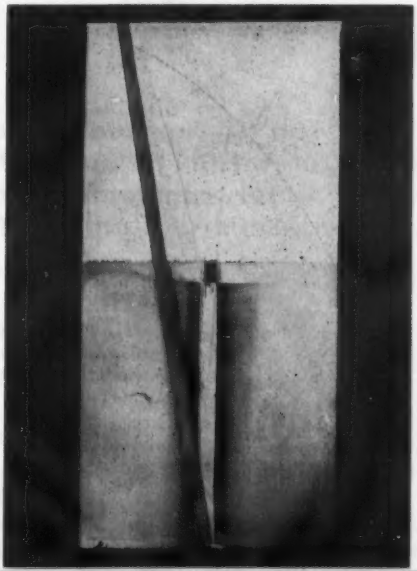
FOR THE PLATING INDUSTRY



QUALITY THAT SPEAKS FOR ITSELF—The upper half of the above silver plate was finished with Nikolas 2105 Clear Lacquer; the lower half with competitive recommended clear silver lacquer. A rubber band was placed over the two finishes and in two weeks the free sulphur had penetrated the competitive material with the above results.

The same results can be expected when testing No. 2105 Clear Lacquer for Hardness, Mar-resistance and Discoloration from direct sunlight.

The finest plated goods are protected by Nikolas Clear Finishes.

Eye Appeal Sells Your Product!

Sixty-Seven Years of manufacturing know how available for any of your finishing problems.

NIKOLAS

G. J. Nikolas & Co., Inc.

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Barrel Tumbling:

"Do's" and "don'ts" that aid in producing a better finish by barrel finishing . . . specific recommendations as to media, water, compounds, barrel speeds, rinsing, drying, separating media from parts . . .

By R. W. FITCH
Field Engineer, Product Development
Electro Minerals Division
The Carborundum Company
Niagara Falls, N. Y.

TUMBLING, OR BARREL FINISHING, has been defined as an operation used to remove undesirable burrs; other definitions would place it in the category of a tool for finishing materials to a controlled r.m.s. Whatever the definition, tumbling and the tumbling barrel have become integral parts of a large number of finishing processes in modern industry. As is true of most finishing processes, there are correct methods for tumbling and ways to correct faulty procedures.

Several developments of recent origin have contributed to improved barrel tumbling. Not until media of controlled quality and size came into being did tumbling become a process whereby the end results could be predetermined. The advent of improved compounds has played an important part in the success of tumbling operations which were thought impossible 15 years ago. Findings during the interim have supplied three benefits to industry — high production, quality, and economy—all with a simple "tool" —the tumbling barrel.

For a plant to set up a tumbling operation, four basic components are needed: (1) barrel; (2) media (usually abrasive); (3) water; and (4) compounds (cleaners, abrasive additives and burnishing soaps).

Barrels

Tumbling barrels are supplied in the following types: (1) straight; (2) triple action; (3) slide action;

How to Get Best Results

(4) submerged type; (5) tilting type; (6) bench type.

When any of these different types of barrels are used in production operations, an automatic timing switch is desirable, and in many instances a reversing switch serves a useful purpose.

Media

Abrasives are available in many shapes and types. A fast-cutting medium originates from an electric furnace product — usually aluminum oxide, and in some instances silicon carbide. These are used as self-contained media, or, in many cases, are bonded with other materials in specific grit sizes and shapes.

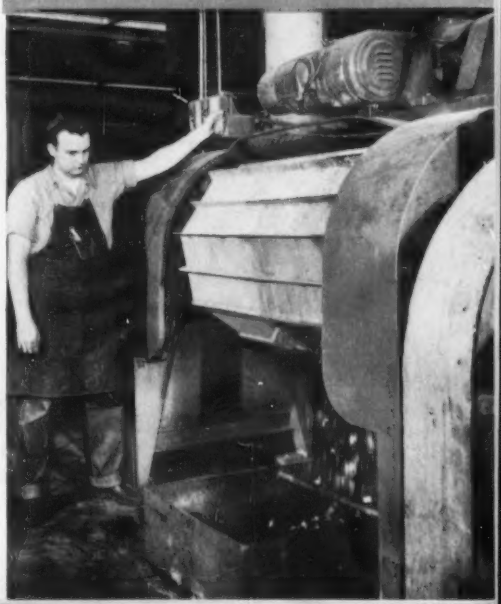
Popular tumbling media include aluminum oxide tumbling nuggets; aluminum oxide tumbling grain; aluminum oxide pellets bonded with rubber; aluminum oxide pellets, ceramic bonded; media of a specific shape composed of aluminum oxide and other electric-furnace products; wood; leather; corn cob grits or meal; natural stones; various metallic shapes—balls, cones, stars.

Water

Water is the third material necessary for tumbling. In many in-

Fig. 1—Tumbling typewriter parts in a tilt-type tumbling barrel at Remington Rand, Elmira, N. Y. Random-shaped media is used.

Fig. 2—At the end of a tumbling operation in a horizontal barrel, the media and parts are emptied together preparatory to washing and separation by screening methods.



stances, it is the most critical, because of the pH factor, which frequently influences the "finish" and "color" desired. The purpose of water is to keep abrasive clean (eliminate loading); keep parts clean; and improve sliding action (it functions as a non-oily lubricant). Less water increases cutting action and, at the same time, produces a rougher finish. Conversely, a larger proportion of water increases the cushioning action of the media. Consequently, it slows rate of cut, but produces a higher finish.

Cleaning Compounds

The success of most tumbling operations depends upon the type of cleaner used. Cleaners are either alkaline, acid or neutral. Their function is to keep media and parts

"Do's" for Media

1. Use large media for rapid burr removal, provided finish is not important.
2. Use small-size and well-worn media where a high finish is required and rapid cutdown is not a requirement. Also use small media on fragile parts.
3. Use a size which will not lodge in holes or recesses.
4. If slots and holes dictate the use of two sizes of media, use approximately 25 per cent of the larger and 75 per cent of the smaller media.
5. Choose a size, or sizes, which can be screened or separated from the parts.
6. Use three to five times as much media as parts (by volume) for general ferrous work. By increasing ratio of media, finish will be finer, all other factors being constant.
7. When the ratio of media to parts is 5:1 for steel, use 7:1 for magnesium or aluminum, all other conditions being the same.
8. Make the total load (media and parts) 60 to 75 per cent of barrel capacity.

"Don'ts" for Media

1. Don't use large media for fragile parts. The parts may be bent or damaged.
2. Don't use media with sharp edges if a low r.m.s. is desired.
3. Don't fail to neutralize medium after it has been used, and before it is placed in storage bin. Otherwise, the residual contamination may cause undesirable results when used for later tumbling jobs.
4. Don't fail to screen media after using so that worn pieces may be channeled to their respective bins.
5. If nicking and scratching are undesirable, don't include a high volume of parts.

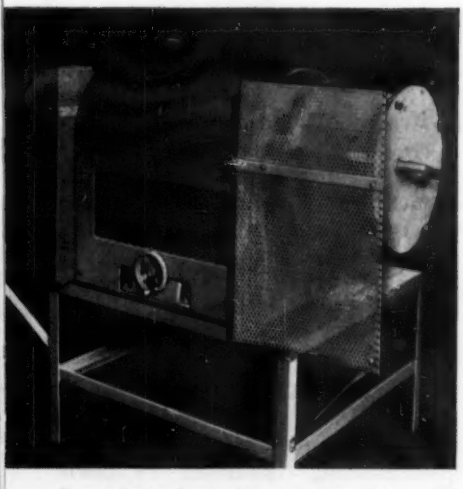


Fig. 3—Example of a single-compartment-unit installation of a tumbling barrel.

clean and to hold soils in suspension while the media do the work.

Several types of cleaners are employed in tumbling.

Alkaline cleaners, such as sodium carbonate (soda ash) or trisodium phosphate soften the water and increase the pH. This makes possible the rapid removal of oil from parts. Excessive oil or grease on parts should be removed from parts before placing them in the barrel. Several methods are available for degreasing. Among them is a hot alkaline dip, followed by a water rinse. Alkaline cleaners also arrest oxidation or rusting on ferrous parts. They are used to neutralize parts and media which have been subjected to acids. Trisodium phos-

Fig. 4 — A typical barrel finishing installation featuring multiple-compartment units.

"Do's" for Water

1. For rapid cutdown, have water level 1 to 3 inches *below* level of mass.
2. For burnishing, raise water level to 75 per cent of barrel capacity.
3. Use clean water with a pH as close to neutral as possible.

"Don'ts" for Water

1. Don't have water level too low when tumbling, as heavy parts may be nicked or scratched by colliding with one another.

"Do's" for Cleaners

1. Avoid hard water by using a softener such as sodium carbonate (soda ash) or trisodium phosphate for iron and steel. (1 oz. per 40 lb. of media.)
2. Thoroughly rinse the parts and media immediately after tumbling with an acid cleaner (a short delay at this time would ruin the parts).

"Don'ts" for Cleaners

1. Don't use sodium carbonate or trisodium phosphate with magnesium or aluminum. Etching will result, and an explosion could occur in an unvented barrel.
2. Don't use an acid cleaner with sodium cyanide, as a poison gas will be generated.

phate or soda ash should not be used on magnesium or aluminum, as etching may result.

Acid cleaners are used to descale and remove oxidation from ferrous parts, brass, and so on, in lieu of pickling. Simultaneously, the cleaner must hold in suspension the soils which are undesirable.

Neutral cleaners are becoming increasingly popular, because they can be used on practically all metals; thus they eliminate the need for many different containers in the tumbling room.

In summary, a good compound must contain rust preventives; have good sudsing characteristics (suds life and suds size); be capable of suspending "fines;" have water conditioner (to make water soft); have favorable surface-tension qualities (to give film); not be a dermatitis hazard (on certain operations this condition cannot be met).

Abrasive Compounds

Compounds containing aluminum oxide or silicon carbide grain are

Fig. 5—Loading tumbling barrel with small typewriter parts and random-shaped media.

frequently required on specific jobs to augment the cut of the abrasive medium. Many ready-mixed compounds are available, with varying characteristics, for specific materials and end-requirements. On the other hand, many operators elect to formulate their own mixture. When this is practical, approximately ½ to 1 pound of abrasive grain (such as a blocky 180-grit alum oxide) per cubic foot of medium is added to any of the aforementioned cleaners. Since these electric furnace abrasives are chemically inert, unfavorable reactions will not occur.

Burnishing Compounds

Since burnishing is actually the "smearing" or "flowing" of metal, causing the resulting surface to have "color" or favorable light-reflection characteristics, it is necessary that the medium be a non-cutting type. To convert an abrasive nugget from a cutting to a non-cutting medium, it is necessary to load it with soap so the abrasive surface no longer cuts or scratches.

Many barrel burnishing operations are performed with the same media as used for the cut-down. The most common procedure used when going to a burnishing operation from whatever was done previously is to rinse the existing load, add clean water and a burnishing compound and rotate until the desired color is acquired. Many compounds may be used from the initial operation (deburring or cutdown) through burnishing. In such instances, a supplemental quantity of compound is added at the start of the burnishing cycle.

Nearly all burnishing operations require a different barrel speed as well as water level, because a cushioning effect between parts and media must be created to provide satisfactory color. While aluminum oxide nuggets are often used successfully for burnishing, the best results are obtained with clean, hard steel balls.

Barrel Speeds

For deburring or cutdown, the

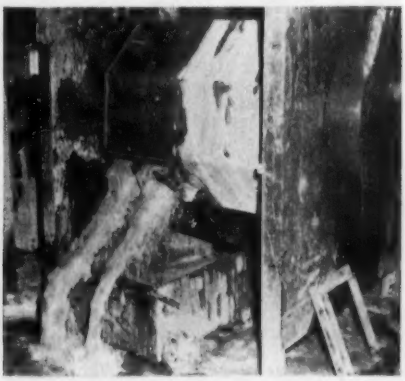


Fig. 6—After tumbling, parts and media are flushed with cleaning compound and water.

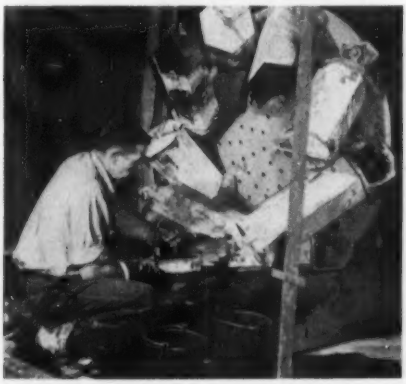


Fig. 7—Unloading slender, flexible parts from Multi-barrel Slide Honing Machine.

"In barrel finishing, thorough rinsing of the parts and media spells the difference . . ."

peripheral speed of the barrel should be 125 to 200 s.f.p.m. If burrs are large, speeds must be lower at the beginning of the cycle to prevent peening. Fragile parts also require lower speeeds.

In most cases, the speed used for burnishing is 60 to 140 s.f.p.m. Higher speeds, however, are used frequently, particularly when the mass represents 75 to 90 per cent of barrel capacity (the latter being common when the danger from nicking exists or when fragile parts are burnished).

Because the optimum speed for any barrel finishing operation is a function of many factors such as media-part ratio, type of metal, shape of part, load in barrel, size of media, level of water and desired finish, it is necessary to find the optimum speed by experimentation.

Rinsing

In barrel finishing, thorough rinsing of the parts and media spells the difference between parts which are acceptable and those which may be rejected. This is particularly true when good "color" is desirable.

To get thorough rinsing, the barrel must be clean before the charge is added. Frequently the use of sundry chemicals causes an accumulation of precipitated deposits in spite of the usual water rinses following each operation. This contamination may cause "color" difficulties on certain metals. Strong acid solutions are available to remove these

Fig. 8—Cleaned parts and media are unloaded from tumbling barrel into tote pan. Parts and media are intermixed. Photo taken at Remington Rand plant, Elmira, New York.

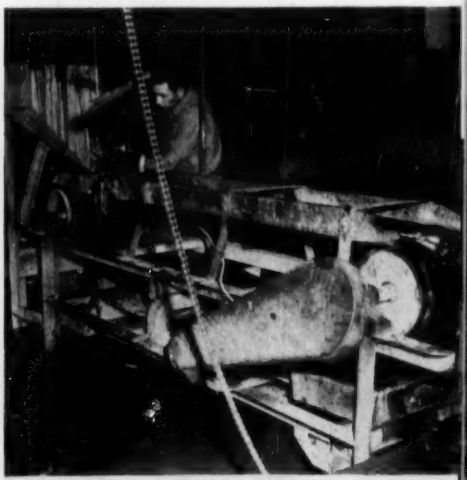


Fig. 9—Mixture of parts and media is loaded on magnetic separator (left). Conveyor belt carries mixture over magnetic drum. Media drops into one pan, parts in another.

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Fig. 10 — Media drops into tote pan only partially shown in foreground, while parts cling to conveyor belt in magnetized area. Parts are carried around and release in tote pan, under machine's magnetic separator.

accumulated deposits. The solution is slushed for a short period, and after standing two or three minutes, the barrel is thoroughly rinsed with clean water.

If parts to be tumbled aren't clean, they should be dipped and/or rinsed to remove all traces of oil and grease. The presence of the latter will prolong the cut-down cycle.

The media must be cleaned after the previous operation. Otherwise, unfavorable effects may be caused by the reaction between acids and alkalies.

Parts must be rinsed clean after certain operations because the presence of an alkaline cleaner would have a neutralizing effect on any parts which were later to be given an acid bright dip. Likewise, the presence of an acid cleaner on parts would nullify certain useful ingredients in burnishing compounds.

Many barrel finishing rooms have installed tanks for the purpose of thorough rinsing after the tumbling operation. The tanks are usually three in number and include one each for cold water, hot water, and oil rust preventive. The dipping is usually in that order—cold water dip followed by hot water, then oil.

The water tanks are designed to overflow continuously. This permits undesirable elements to be floated off the surface. The hot water temperature is thermostatically controlled and is held at 180 deg. F.

The oil-dip tank is usually made so that water which settles to the bottom can be drawn off.

Drying

Where drying of the parts is necessary, several different methods may be employed. The use of infrared lamps is relatively inexpensive and lends itself to either stationary or conveyorized installations. Another method of drying parts is to tumble in heated sawdust.

Parts may be tumbled in corn cob meal. This material has a high water-absorbing characteristic, and the cost is only a few cents per pound. Centrifugal drying equipment is used in shops which have high production requirements.

Typical Tumbling Job Analysis

In any tumbling job, the user has two known factors with which to be-

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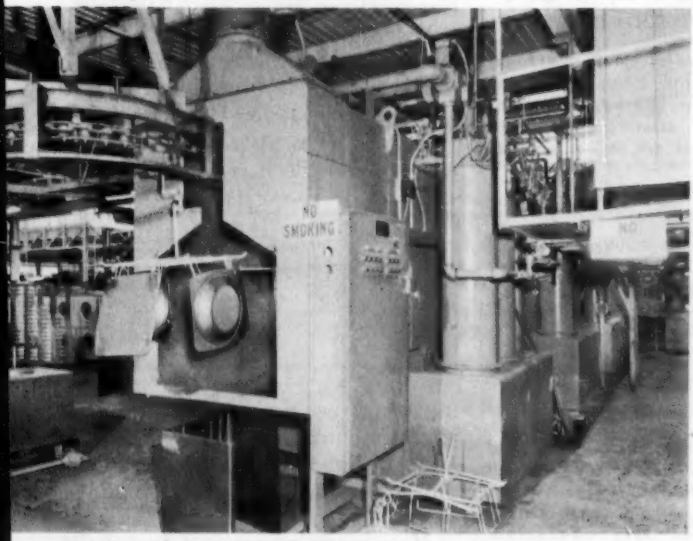

Miscellaneous Parts Entering P-D 5-Stage Phosphatizing Machine.

The illustration shows part of a finishing system designed, engineered, built and installed by Peters-Dalton. The other components include Flow Coat Painting and Roof-Top Baking Ovens. The problem presented to Peters-Dalton required the locating of this important production equipment in a decidedly limited area of the plant in which it was to be installed. Here again the experiences gained by Peters-Dalton, during more than a quarter century of designing and building all types of finishing equipment, proved invaluable.

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Fig. 11—The two piles at the left are untumbled Aloxite Nuggets, sometimes requested for initial fast cut where some scratches and nicks are acceptable. At right are pretumbled Aloxite* Nuggets. These have the sharp corners and edges removed before shipping, thus assuring smooth finishes on the parts that are to be tumbled.*

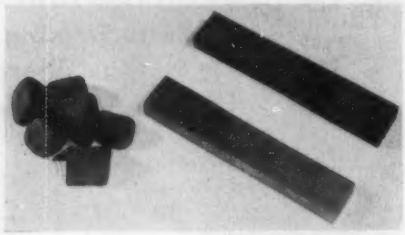


Fig. 12—Steel bars (right) before (top) and after tumbling with Carborundum ¾-inch Triangle Tumbling Pellets. A new pellet (left) is shown in front of media which has been used several times in this operation.

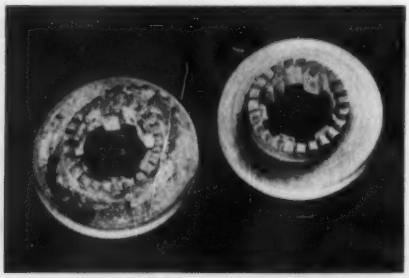


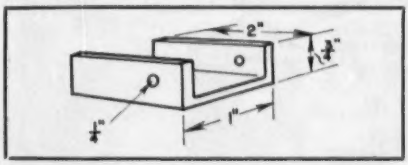
Fig. 13—Part at right of photo has been tumbled with Aloxite Nuggets to remove the scale formed during heat treatment process.*

Note: Aloxite is a brand name of The Carborundum Company.*

gin: a barrel with a known capacity, and a specific part which must be finished to certain specifications. All other factors, such as media, cleaner, water and so on are contingent on the two factors mentioned above.

Using the known quantities as a starting point, an analysis of the job can be made by following the steps outlined here.

Take a typical piece for an example. The piece is a steel stamp-



ing which requires deburring on all edges, including the inside edges of ¼-inch-diameter holes. The finish must be bright. Corners may be slightly rounded.

How many pieces and how much media should be placed in the barrel? To solve this problem, make the following calculations: "box" volume of the piece is 2 by 1 by ¾ inches, or 1½ cubic inches. The approximate number of pieces per cubic foot would then be 1150. Assuming that the barrel has a total volume of 10 cubic feet, and that the barrel is 60 per cent full (parts and media), this would leave 6 cubic feet to consider. If the ratio of parts to media is 1:5 by volume, the number of pieces required per load would be 1 cubic foot (1150 pieces) and 5 cubic feet of media (approxi-

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Table I

S.F.P.M. CORRESPONDING TO R.P.M. FOR VARIOUS BARREL SIZES

Surface Feet Per Minute	Barrel Diameter (inches)									
	40	36	32	30	28	24	20	16	15	12
50	4.8	5.3	6.0	6.4	6.8	8	9.5	12	13	16
60	5.7	6.4	7.2	7.6	8.2	9.5	11.5	14.3	15.3	19
70	6.7	7.4	8.4	8.9	9.5	11	13.3	16.7	17.8	22
80	7.6	8.5	9.5	10.2	10.9	12.7	15.3	19	20	25
100	9.5	10.5	12	12.7	13.6	15.9	19	24	25	32
120	11.4	12.7	14.3	15.2	16.3	19	23	29	31	38
150	14.3	15.9	18	19	20	24	29	36	38	48
180	17	19	21	23	25	29	34	42	46	57
200	19	21	24	25	27	32	38	48	51	64
225	21	24	27	29	31	36	43	54	57	72
250	24	27	30	32	34	40	48	60	64	80

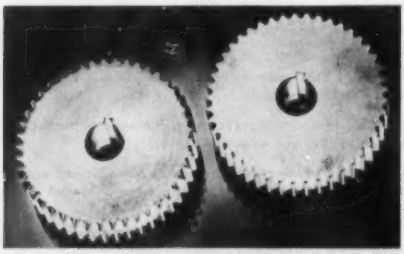

Fig. 14—The gear at right has been tumbled with Aloxite Nuggets to remove burrs formed during machining operations. This aluminum oxide tumbling media is an electric furnace product, produces a fast rate of cut.*

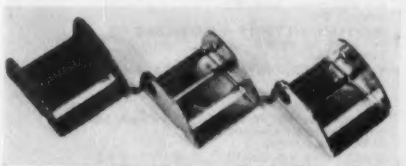

Fig. 15—Aircraft seat-belt buckle is shown (left to right) before being tumbled, after being tumbled, and after being plated. Tumbling operation removes all rust and burrs and tumbling "breaks" the edges of part.

mately 600 pounds of nuggets).

What size media should be used? Because of the ¼-inch-diameter holes, the media selected should either pass through easily or not pass through the holes. Any size media which would lodge in the holes would give unsatisfactory results. The size of the No. 6 aluminum oxide nugget (American Standard) is such as to permit all pieces to pass through the holes, while the No. 2 size is sufficiently large that none would lodge or enter holes of this diameter. Because of its smallness, the rate of burr removal with the No. 6 nuggets would be slow. Therefore, as a starting recommendation, the No. 2 size is suggested. Should the flat surface finish requirements be higher than that which can be obtained satisfactorily with the No. 2, and should the production justify it, a mixture of No. 6 and No. 2 could be made by using 75 per cent of No. 6 and 25 per cent of No. 2 nuggets.

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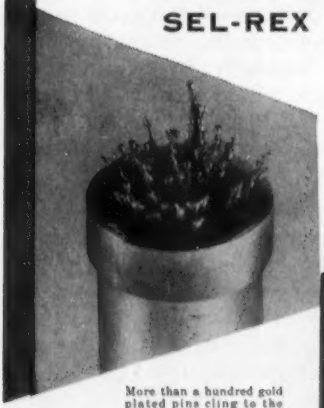

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"Keep the water level slightly below mass level for maximum burr removal."

One ounce of soda ash, or some prepared compound, per 40 pounds of media would keep parts and media clean, and simultaneously, would give protection against rusting.

How much water should be in the barrel? Keep the water level slightly below mass level for maximum burr removal. A higher level (2 inches above mass) gives a slower cut but a higher finish, all other factors being constant.

What is the best barrel speed? About 150 s.f.p.m. is an average speed for this type of operation (see r.p.m. chart (Table I) for various barrel diameters. If the burrs are heavy, a much lower speed for the first ten minutes of the cycle would permit burrs to be cut rather than peened. Normally, from 30 minutes to 2 hours is required for an operation of this type, depending upon the initial condition of the part and the finish required.

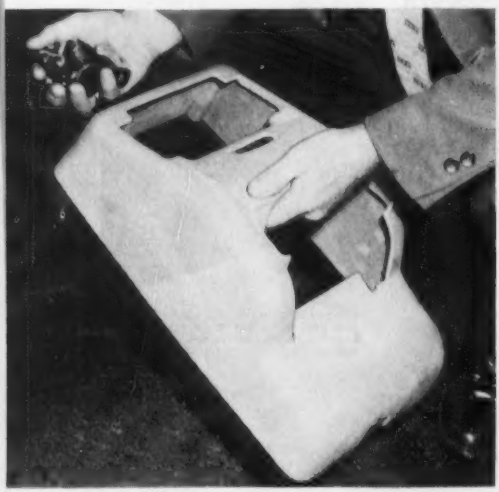


Fig. 16—Large parts, such as this adding machine housing, are also tumbled with random-shaped media at the Remington Rand plant, Elmira, New York. (Photo courtesy The Carborundum Co., Niagara Falls, N. Y.)

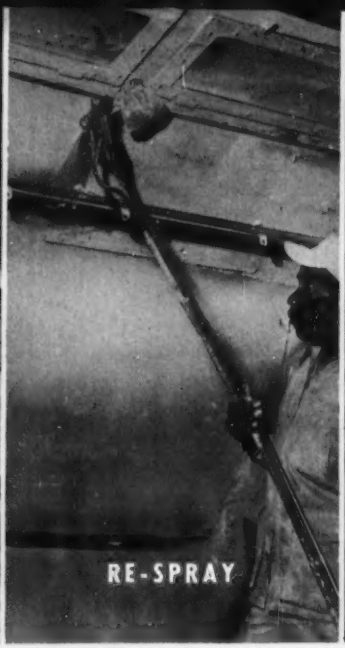
Separating Media and Parts

Segregating the finished pieces from the media is an operation which cannot be avoided. Consequently, careful consideration should be given when selecting the media. Otherwise, hand sorting of non-magnetic parts from the media having the same approximate size would be necessary, because screening would not be effective. There is equipment, however, such as specific gravity separators, which can be adapted to the separation of certain type parts and media.

Screening Media

Keeping the media properly classified, insofar as size is concerned, is a chore which cannot be bypassed if lodging and wedging of media are to be prevented. If the parts to be tumbled consist of pieces without holes or slots, a mixture of various sizes presents no problem unless the established procedure for a given job is exacting.

Well-equipped barrel finishing rooms have screening equipment over which all nuggets are passed before being placed in bins. The media are elevated to vibrating screens, screened to the various sizes, and then they flow by gravity to their respective bins.



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H. E. Head is past president of the Detroit Branch, A. E. S., and 1st vice president of the American Electroplaters' Society. He has been active in the electroplating industry for many years.
In addition to his work in the A. E. S., Mr. Head serves actively in the following organizations: A. S. T. M. Committee B-8 on Electrodeposition, Society of Automotive Engineers, the Electrochemical Society, the Engineering Society of Detroit, and the Sea Horse Institute.

Part 1

Early Developments

The machine known to us today as a generator was first referred to as a magneto-electric machine and later as a dynamo.

Depositing metals by means of a permanent current of electricity obtained from steel magnets was perfected and first successfully worked by Prime & Son at a large silverware works in Birmingham, England. The first magneto-electric machine (Fig. 1) was constructed by Woolrich in 1844 and measured 5 feet high, 5 feet long and 2½ feet wide.

Continuous magnetism in the iron cores of the electromagnets was first used in 1866 by Siemens, and again in 1867 by Wheatstone.

The first useful machine was introduced in 1871 by Zenobe Gram-

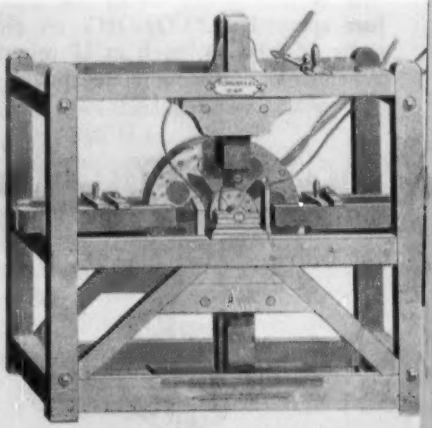


Fig. 1—First magneto-electric generator, constructed by Woolrich in 1844.

for Electroplating

Historical Review

me. The machine used Pacinotti's ring (invented in 1860) in its construction. This machine was, in 1872, succeeded by Hafner-Alterneck's of Berlin. In both machines the poles of the electro-magnet exerted an inducing action only upon the outer wire wrappings of the revolving ring. The other portions were little used. This increased the resistance and caused useless heat, a defect that led to the construction of flat ring machines, in which the cylindrical ring was replaced by one of flat shape and larger diameter. Such a machine permitted induction in both flat sides. The first such machine was built by Siemens & Halske, of Berlin, in 1874; and in the same year by S. Schuckert, of Nurmberg. In Schuckert's machines nearly three quarters of all the wire wrappings were under the inducing influence of both of the larger pole shoes of the electromagnets. The flat ring armature was replaced by the drum armature in later designs.

In the early 1900's several machines were available to the electroplating industry. Among European dynamo-electrical machines were Mather's, Fein's, Krottlinger's, Nagle's, Reutlinger's, Lahmeyer's, Poschmann & Company's, and Dr. G. Langbein & Company's. In this country Weston's machine and the dynamos manufactured by the Hanson-Van Winkle Company of Newark, New Jersey, the Zucker & Levett & Loeb Company of New York were prominent.

How Current is Generated

In the dynamo-electric machines the generation of the current results from induction, and the funda-

Fig. 2—Simplified generator: magnet frame M, iron cylinder A, copper wires (black dots) to cut the lines of the magnetic field.

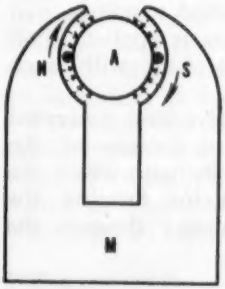


Fig. 3—Schematic diagram below shows the relative positions of the field coils, the magnets, and the armature of a bipolar generator.

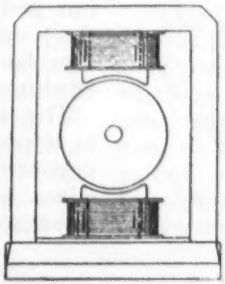
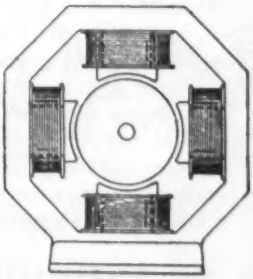


Fig. 4—Schematic drawing below shows the relative positions of the field coils, magnets, and armatures of a four-polar generator.



mental principle may be explained by means of Fig. 2. An iron magnet frame, M, formed of a powerful horseshoe magnet, is shaped with two cylindrically-turned planes. Concentrically fixed to these planes is a cylinder, A, built up of discs of soft iron.

Lines of force running from the north pole to the south pole permeate the soft iron cylinder. If in the air space between the north pole of the magnet and the cylinder, a copper wire, indicated in Fig. 2 by a small black dot be introduced, and moved in such a manner that it cuts the lines of force flowing from the north pole through the air space to the cylinder, a current is induced, and a certain electromotive force appears at the ends of the wire. By moving the left-hand wire in the direction indicated by the arrow, the current will flow away from the observer into the plane of the illustration, and by moving the right-hand wire in the direction of the arrow, the current will flow out from the plane of the illustration towards the observer.

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The wire may also be insulated from the soft iron cylinder and secured to it. If the cylinder be moved around its axis now, the wire cuts the lines of force in exactly the same manner as in its motion in the air space, and produces the same electrical force. If several wires, each alongside another, be secured upon the cylinder, a corresponding electromotive force will be produced on the ends of each wire, the positive poles of the wires being then on one side of the pole pieces, while the negative poles of all the wires lie upon the other side. If the wires be connected one with the other, so that, when the cylinder is revolved, a positive pole is always attached to a negative pole, the electromotive force is raised in the same degree as the number of wires coupled one after the other (in series) increases.

These wires fastened upon the iron body are called windings, and the term armature is applied to an iron body furnished with such windings.

The electromotive force generated in the windings is the greater, the greater the velocity with which the wires, or conductor forming the windings, are moved through the

magnetic field. If the length of the conductors be increased by enlarging the windings, and the velocity with which the armature moves remains the same, the electromotive force generated in the conductor is proportional to the length of the latter. If the magnetic field be strengthened, thus increasing the lines of force cut by the conductor during its motion, and the velocity with which the conductor moves, as well as its length, remains the same, the electromotive force is proportional to the number of lines of force, reaching its greatest value when the lines of force are being cut perpendicularly.

The magnetic field is produced by electro-magnets. These field magnets are wrapped with wire through which the current, by which they are magnetically excited, is conducted. According to the number of field magnets, a distinction is made between two polar, four polar, six polar and multipolar machines. Figure 3 shows a two polar machine, and Fig. 4 shows a four polar machine of the type built by Dr. G. Langbein & Co., Leipsig, Germany, in the early 1900's.

For the production of the magnetic field, the current was formerly conducted from another source of electricity into the magnetic windings, but since the discovery of the dynamo-electric principle by W. V. Siemens, the electric current generated in the armature is utilized for excitation of the magnetic field.

The armature consists of a cylindrical iron body and windings wrapped around it. The iron body cannot be made of one piece because rotary currents would be

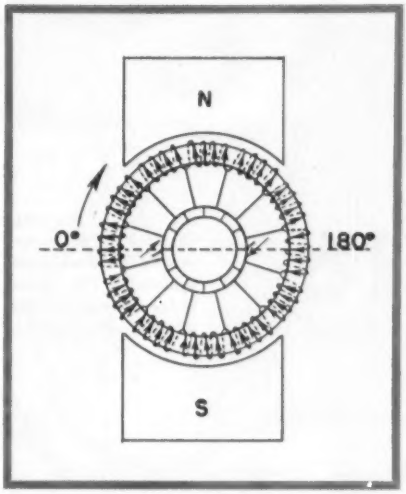

Fig. 5—Ring armature with windings wrapped in continuous spiral around armature core. Core must have wide bore in center so that sufficient number of windings can go through. Currents of opposite direction flow in each half of windings of ring armature.

formed in it, with resultant heat and loss of current; hence the body of the armature is built up of thin, soft, sheet-iron discs insulated one from the other by discs of paper. The discs are firmly pressed upon the core of the armature and secured by screws, while the core of the armature is wedged upon the shaft.

According to the manner in which the wire windings are laid around the armature-core, a distinction is made between a ring armature and a drum armature.

In the ring armature the wire windings are wrapped in a continuous spiral around the armature-core. It is necessary for the latter to have a wide bore in the center through which, in wrapping, the conducting wire may be carried.

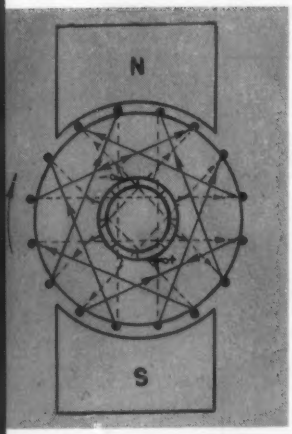

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Fig. 6 — Drawing shows how wires are wound on drum-type armature. This view is taken from the side of the commutator.

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Figure 5 represents a scheme of such ring winding.

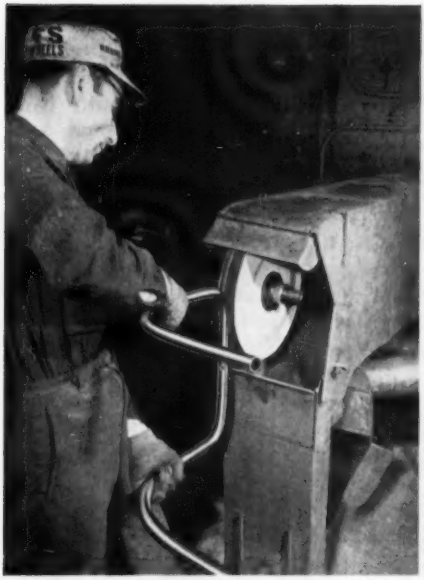
N and S are the two field magnets of the frame. Every two of the continuous wire-windings represent a coil, and from the point where the end of one coil is connected with the commencement of the next coil, a conducting wire branches off to the collector. According to what has been said, induction is greatest when the windings of the wire cut the lines of forces at a right angle. This is the case when the windings are directly under the poles. In revolving the armature from 0 to 90 degrees, the generation of current increases; from 90 to 180 degrees it decreases; from 180 to 270 degrees it increases in a contrary sense; and from 270 to 360 degrees, it again decreases. Thus, currents flowing alternately in opposite directions, the so-called alternating currents are generated, and their conversion to constant currents of uniform direction is effected by the commutator. At 0 and 180 degrees, the generation of current is equal to 0, and at these points the current changes its direction; the line 0 to 180 degrees is called the neutral zone.

In the drum armature the conducting wires are wound upon the armature-core parallel to its axis, carried on the faces of the core around the core-shaft, and the ends of every two coils lying along side of each other on a face are connected, one with the other, and a segment of the commutator. Figure 6 shows the drum winding viewed from the side of the commutator.

Each coil is only indicated by a single wire winding, and therefore eight coils are shown. The dark lines indicate the connection of the coils upon the commutator side, and with the commutator, and the dotted lines indicate the coil connections upon the opposite face.

What has been said in regard to the intensity of induction in ring armatures applies also to drum armatures.

Drum winding has the advantage that the armature-core can be provided, parallel to its axis, with grooves or slots for the reception of the windings. In such armatures, even when equipped with thick copper wires or flat copper bands, scarcely any rotary currents are generated, because the slots are but slightly permeated with lines of force, the latter running rather around the copper wires through the iron. The chief advantage of such an armature is that the air space between armature and magnet-pole can be less than in arma-



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tures with windings not placed in slots. Hence for armatures furnished with slots, the number of amperewindings may be less than for smooth armatures. Figure 7 shows a slotted armature of a dynamo constructed by Dr. G. Langbein & Co., in which the conductors consist of flat copper rods, connected on the faces by bent copper bands called evolvents.

The commutator is a cylindrical body built up of segments and fastened to the armature shaft. It is insulated with mica. The segments consist of copper, tombac or brass. They are insulated from each other as well as from the commutator frame. The commutator has as many segments as the armature has coils, and every point of junction of two coils is connected by means of copper with a segment. The function of the commutator is to convert the alternating currents of the windings generated by induction into constant currents of uniform direction. As seen from Fig. 5, currents of opposite directions flow in each half of the windings of the ring armature. If sliding contacts are placed on the commutator on the points of the neutral zone, the current of one-half of the winding is carried along as positive current by one of the sliding contacts, and the negative current of the other half by the other sliding contact. The armature winding is divided into two halves by the brushes, which are coupled parallel to each other.

The function of the brushes is to take off the current from the commutator. Brushes are made of fine copper or brass wire gauze, or of thin metal plates. Carbon brushes were often used for dynamo-electric motors.

There should be as little commutator wear as possible. Copper and brass gauze brushes produce by their wear considerable metallic dust, which, if not removed, may readily cause short-circuiting. Brushes of twisted, thin metal plates (Boudreaux brushes) do not show this disagreeable formation of dust, and cause but little wear of the commutator, rather polishing it. They do, however, oxidize readily due to heating. This oxidation is not removed by the friction, and greater resistance is thereby opposed to the passage of the current from the commutator to the brushes.

The bearing surfaces of the brushes should be so large that no heating is caused by the passage of the current.

The brush holders serve to secure

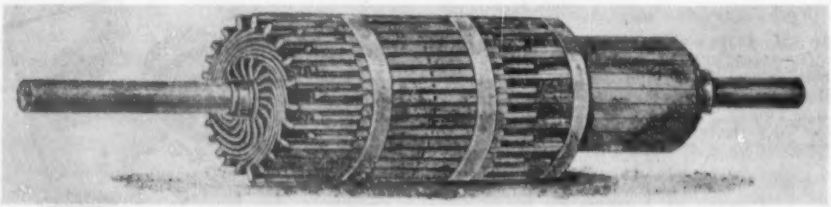

Fig. 7—Slotted armature of dynamo constructed by Dr. G. Langbein & Co. Conductors consist of flat copper rods, connected on faces by copper bands called evolvents.

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the brushes and should hold them so as to bear on the commutator with an even pressure.

The brush rocker carries the brush holder. In multipolar dynamos the rockers are equipped with as many bolts as there are poles. These bolts are insulated from the rocker, yet secured to the rocker by insulated nuts.

The rocker is mounted upon the turned end of a bearing, and is concentrically movable to its axis, so that by turning it, the brushes may be shifted into a position at which the dynamo runs with the least sparking. The brush holder is secured in this position.

If the whole of the current traverses the coil of the field magnet, the dynamo is said to be series-wound; or if a portion of the current be shunted, we have a shunt - wound machine. There may be a combination of the two, in which case the machine is a compound-wound dynamo. Whatever be the arrangement, provided the volume of the copper and the density of the current are the same, the same field is always produced.

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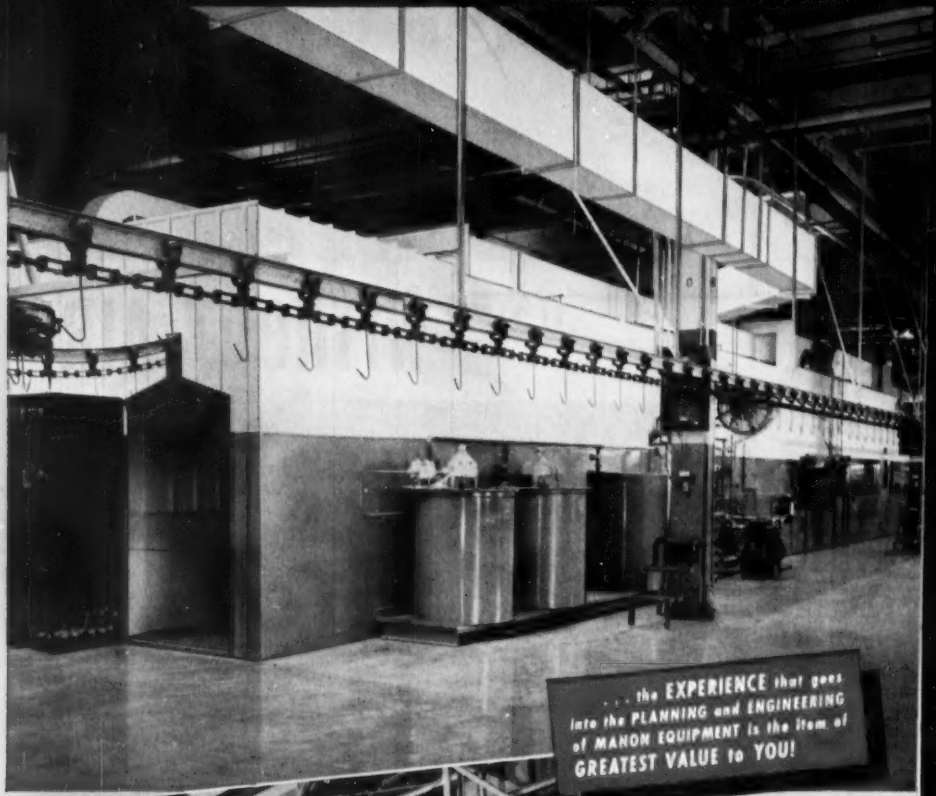

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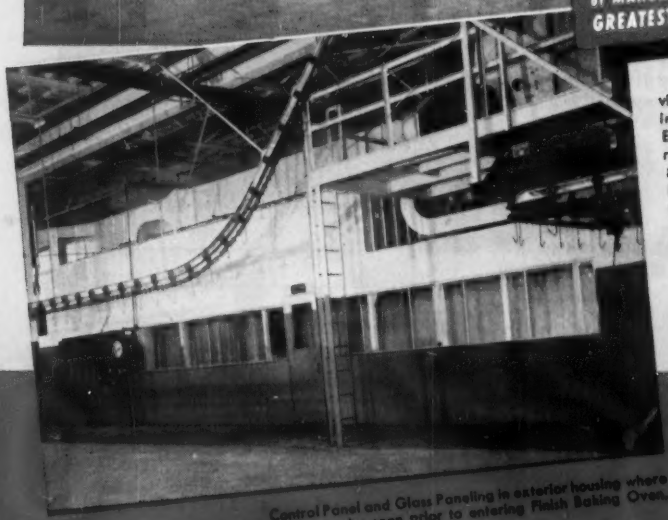

Control Panel and Glass Paneling in exterior housing where parts may be seen prior to entering Finish Baking Oven.

At the right above is a general view of the Complete Mahon Finishing System for Flow-Coating Black Enamel Parts at Chrysler Corporation of Canada, Limited. The 80 Ft. x 24 Ft. 450° Enamel Baking Oven, which is built against the roof trusses to provide storage space below, is visible in the background. Directly above is a close-up of the entrance end of the Flow-Coater showing Paint Mixing Tanks, Solvent Tank, Recirculating Equipment and Operating Control Panels.

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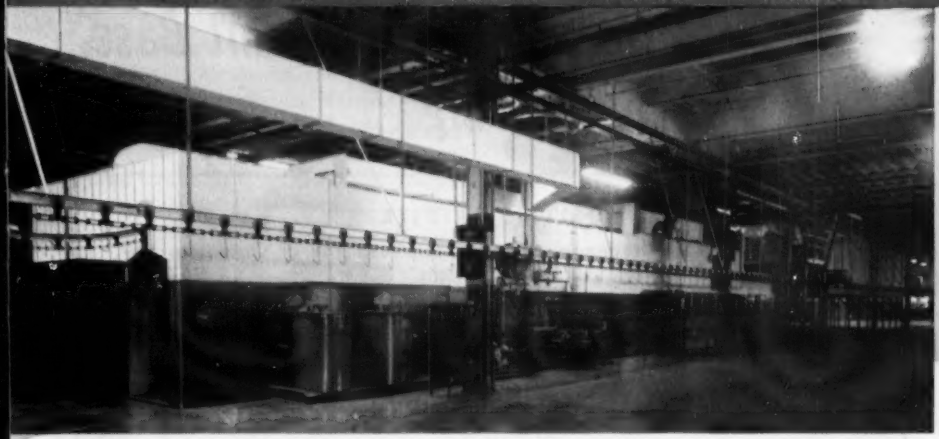

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1. THE COATINGS THEMSELVES. There are many brands on the market. All are similar in many ways. Each, of course, offers its own specific advantages and these may relate to operating techniques, performance under actual use conditions, cost, availability, etc. Naturally, you'll want to choose a coating that is widely known and accepted under both military and civilian specifications.

2. THE COMPANY BEHIND THE PRODUCT. Is it a reliable, established organization? Does it offer experienced technical service, both from the field-engineering organization as well as the home office and laboratories? The man who sells and services your installation should be thoroughly familiar with not only chromate conversion coatings and their applications, but also with the characteristics and performance of related finishing operations such as pre-cleaning, electroplating, painting, etc. This is most important since all steps of the finishing cycle must be functioning

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3. AVAILABILITY OF THE PRODUCT. Ideally, of course, the material should be readily available to you from nearby warehouses to avoid time loss in long distance shipping and to provide emergency service, should the need arise.

4. COST. Naturally, the initial price of the material is important to you. However, just as you consider ultimate cost when you are buying mechanical equipment, ultimate cost must be considered for these finishing chemicals. So, it will pay you to investigate consumption costs, labor costs and the other factors which go into the determination of ultimate cost. Further, cost alone gives no indication of product performance, so careful attention must be given to the purpose the finish must serve and the value that finish will add to your product.

5. FACILITIES FOR RESEARCH AND DEVELOPMENT. Perhaps the existing types of chromate conversion coatings do not include a compound that will accomplish exactly what you wish. Then, it is important to deal with a supplier who has adequate research and development facilities available to work with you to produce a material to meet your needs. Naturally, such a project is seldom completed overnight. But, with complete cooperation and confidence from both you and your supplier, chances are a satisfactory program can be completed.

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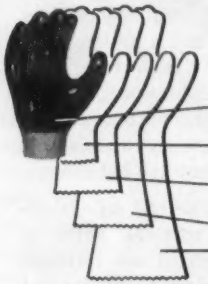

Length	Style	Weight	Model
10″	Knit wrist	Light	80
10″	Knit wrist	Industrial	90
10″	Knit wrist	Heavy Duty	95
10″	Gauntlet	Industrial	100
10″	Gauntlet	Heavy Duty	105
12″	Gauntlet	Industrial	120
12″	Gauntlet	Heavy Duty	125
14½″	Gauntlet	Industrial	140
14½″	Gauntlet	Heavy Duty	145
18″	Gauntlet	Industrial	180
12″	Gauntlet	Twin lined*	225

* No. 225 designed to protect hands from extreme hot and cold temperatures.

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5052	Knit wrist	Women's	10″
5232	Band top	Men's	11″
5132	Gauntlet	Men's	12″
5252	Gauntlet	Men's	14½″

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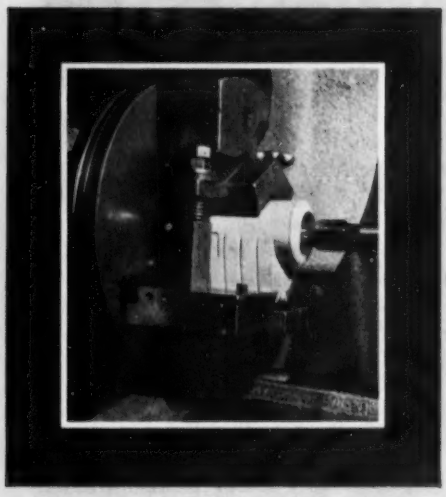
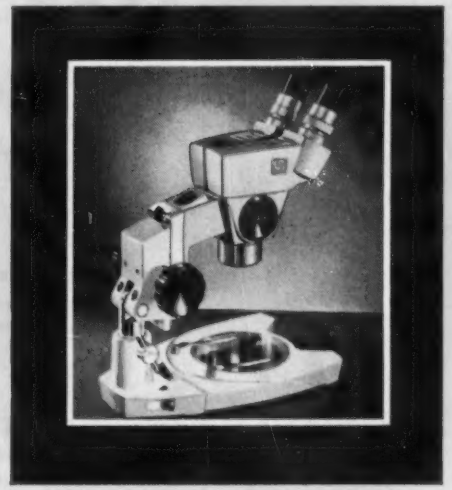


AO Microscope body with Epon resin-based finish is chucked, faced to size, bored, reamed and threaded. Yet the tough Epon finish comes through without a nick or scratch.



A smooth coating of Epon resin-based paint protects AO Stereoscopic Microscopes from abrasion, chemical deterioration and mechanical impact.

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At the American Optical Company, Instrument Division, painted castings for scientific and ophthalmic instruments frequently are machined after the finish has been applied. What happens to the finish? *Nothing.* Why? It is protected by the amazing abrasion-resistance of Epon resin-based coatings.

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To counteract this problem, AO chemists put an Epon resin-based paint to the test. Castings with 2 coats of Epon resin-based paint and others with 2 coats of ordinary paint were immersed in the same solution of 5% sodium chloride, 5% acetic acid, 3% isovaleric acid, 3% butyric acid and water for 96 hours. Result: holes had formed in the ordinary paint finish. The Epon resin coating . . . *still in flawless condition.*

If you have a coating problem, Epon resin-based paint may be your answer. Its unsurpassed abrasion- and chemical-resistance makes it an *ideal all-purpose* industrial coating.

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Chromate Conversion Coatings on Hot Dipped Galvanize

By CHARLES W. OSTRANDER, Technical Director
Allied Research Products, Inc.
Baltimore 5, Maryland

CHROMATE CONVERSION COATINGS ON GALVANIZE are in less demand than any other non-ferrous metals to which these films are applied. This probably is due to the fact that the heavy coating formed by hot dipped galvanizing is considered sufficiently protective in itself to ensure long life without any additional protection. In certain environments, this is a proven fact. The public has been sold on the basis that a bright spangled surface provides the ultimate in quality and protection. Any suggestion to change the appearance of the surface is usually rejected, since it would affect the standard built up over a period of many years. In recent years, however, other metals have become more and more competitive with galvanized products and this may necessitate changes and improvements in procedure.

Strip mills have recognized this fact and have modified the coating procedure on mill galvanize, resulting in much more flexible zinc coatings. Usually sheet is also treated at the mill to minimize or eliminate the formation of white corrosion products during storage.

Under normal outdoor exposure, zinc oxidizes to a light gray color, gradually reducing the thickness of the zinc coating until it disappears and rusting of the base metal occurs. Under other environments, which include high humidity, entrapped moisture, and sea coast environments, zinc reacts with water, oxygen, and acidic substances such as carbon dioxide to form insoluble white corrosion products. These products, commonly termed "white rust," have been found to be primarily a basic zinc carbonate of variable composition. On galvanized steel, zinc acts galvanically as a sacrificial coating in affording protection to steel. In the presence of an electrolyte, such as when galvanized

surfaces are left in contact with a slowly drying stagnant film of water, heavy white corrosion products will result. This type of corrosion is objectionable in many ways.

Since the white deposit results from the conversion of the zinc metal to salts, continued attack will consume all the zinc and lead to early rusting of the underlying steel. The white corrosion products are unsightly and objectionable from the consumer point-of-view, and under certain circumstances, may interfere with moving parts.

The users of galvanize coatings have also been plagued with the problem of obtaining a satisfactory bond when the surface is painted. Even when good initial adhesion is obtained by etching the surface with mildly acidic solutions, continued exposure results in the normal chemical reaction between the oils in the paint and the zinc metal. Insoluble soaps are formed, causing flaking and peeling of the paint.

To date, the use of a chromate conversion coating comes the closest to solving this problem.

Although the corrosion-inhibiting ability of chromium salts has been known for many years, the first record of an acidified chromate solution for the protection of hot dipped galvanize does not appear until 1929, when a German chemist found that an acidulated solution of 0.5 per cent potassium bichromate produced a film which he claimed would eliminate white rust. A patent for this process was granted in France in 1931.[1] It was claimed that by use of this process, the life of the galvanize coating was extended 15 to 20 times that of an un-

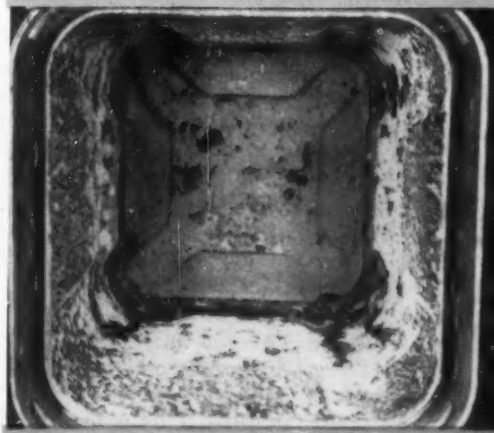

Fig. 1—Hot dipped galvanized container — untreated — showing results of one year test in 4 per cent salt solution.

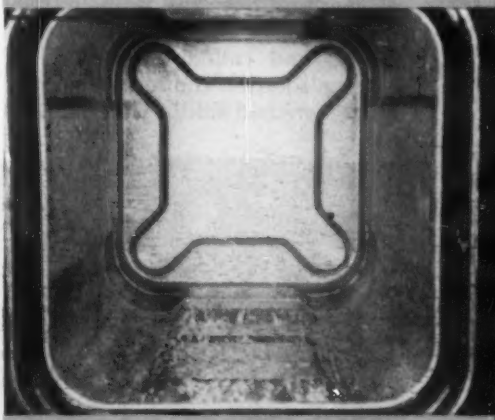

Fig. 2—Hot dipped galvanized container —treated with a chromate — after one year test in 4 per cent salt solution.

"The coating produced has high corrosion protective ability and decorative value."

treated surface. Conditions under which such results were obtained were unfortunately not mentioned. The modern conception of chromate conversion coatings for zinc came almost simultaneously to two unrelated groups of researchers.

In 1935, the Dubpurnell patent[2] was granted to the Udylite Corporation and covered the use of chromium compounds plus other acid or salt activators in an aqueous solution which produced clear, lustrous, corrosion resistant films on zinc and cadmium. This was quickly followed by the granting of a patent to Wilhelm[3] of the New Jersey Zinc Company in 1936. This patent covered the same basic constituents as used in the Dubpurnell patent with the exception that a protective, colored coating was formed. The process resulting from the Wilhelm patent became known as the Cronak process and called for use of an aqueous solution containing sodium bichromate and sulfuric acid. Under normal operation, a highly protective, iridescent yellow-to-brown coating was produced by short immersion at room temperature.

With cadmium in short supply during World War II, a search was made for a cheap metallic coating which could replace cadmium plate and afford a corrosion protective surface.

Zinc was easily available and had an advantage in that the more recently developed cyanide electroplating solutions produced bright, fine grained deposits. This was a great improvement over the gray, coarse-grained deposits formed by the acid zinc plating process. The use of the Cronak process over cyanide zinc plate resulted in a highly corrosion resistant surface, eliminating the problem of heavy white corrosion products under corrosive environments. Except for operational and maintenance problems related to the process itself, the end result was very much

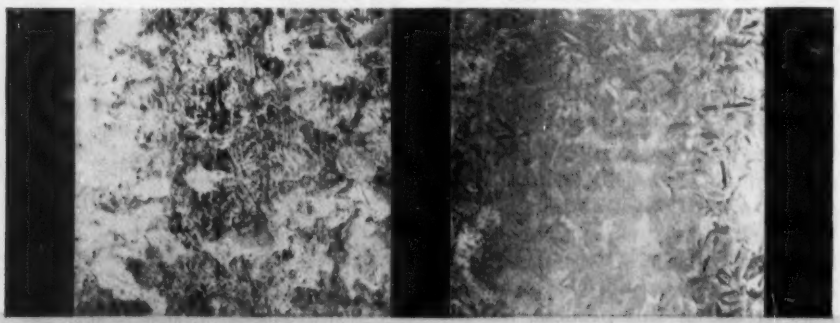

Fig. 3—(Left) Untreated mill galvanized panel after 30-day humidity test. (Right) Mill galvanized panel treated with a clear chromate — after a 30-day humidity test.

of a success. In 1946, two patents were granted to the Rheem Manufacturing Company—one covering a chromate conversion process which produced an olive drab coating having extremely high corrosion protection. A second process produced an iridescent yellow coating similar to the Cronak process but which was much more flexible with regard to operation and maintenance and produced films having more closely reproducible corrosion protection. These treatments were trade marked as the Iridite process. These developments were made in the Research Division of the Rheem Manufacturing Company while searching for protective coatings for hot dipped galvanized drums and water heaters.

Under salt spray test conditions, formation of white corrosion was extended from one hour or less on untreated galvanized surfaces to two to four hundred hours when the Iridite coatings were used. From these and later developments producing workable clear chemical polishing solutions, the use of chromate conversion coatings became acceptable as a necessary part of finishing electrodeposited zinc and cadmium. Further development of chromate conversion coatings extended their use to aluminum, magnesium, copper alloys, and silver. The industry is now served with proprietary materials by a dozen or more suppliers. The reasons for the wide acceptability of chromate conversion coatings are their simplicity of operation, very low cost, and the fact that the coating produced has high corrosion protective ability and decorative value.

The following provides a brief resume of the properties of chromate conversion coatings in general and as applied to hot dipped galvanize in particular.

Definition

Chromate conversion coatings are those formed by immersion of metal in aqueous acidic chromate solutions consisting substantially of chromic acid or bichromate plus other active radicals for chemical treatment.

Formation

Chromate solutions with active

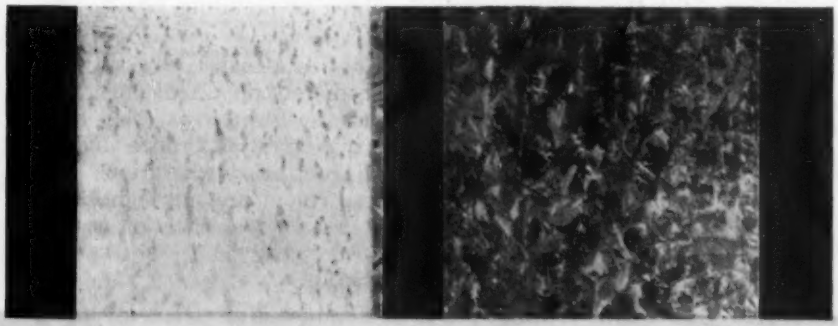

Fig. 4—(Left) Untreated mill galvanized panel after 4 hours in the salt spray. (Right) Mill galvanized panel was treated with a chromate then put in the salt spray for 8 hours.

"The amount of protection is usually in proportion to the film thickness."

inorganic or organic radicals plus acidity dissolve surface metal; this raises the pH of the solution at the metal solution interface to a point where a complex chrome gel is precipitated on the surface. Approximately 0.00001 to 0.0001 inch of the metal treated is removed in the process. The gel-like or amorphous coating contains both trivalent and hexavalent chromium. The nature of the precipitated coatings is governed by the pH of the solution, the nature of the catalyst radicals, and the ratio of their concentrations to that of the chromium compound or compounds used.

On hot dipped galvanize, most chromate conversion treatments will form protective coatings only on relatively pure zinc surfaces. There are, however, proprietary treatments available which will produce protective coatings on burned areas or coatings such as galvaneal where a high iron, low zinc alloy is present. The protective film in this instance will be a dull brown color as contrasted with the highly iridescent yellow color on the pure zinc.

Protective Value

The protective value of a chromate coating will depend upon the surface characteristics, purity and thickness of the metal treated, the type of chromate film applied, the method of application, and the atmosphere to which it is subjected.

The amount of protection is usually in proportion to the film thickness. Heavy olive drab coatings provide maximum corrosion protection, iridescent yellow medium protection, and clear coatings least protection.

Greatest value is obtained under conditions of storage with stagnant water, humid air, or similar environments prone to develop white corrosion products. Some advantage has been found for outdoor exposure. However, this would be much greater along a sea coast than under industrial conditions.

Solubility

Coatings are gradually soluble under aqueous atmospheres. This results in the leaching out of the hexavalent chromium providing a self healing action on scratched or abraded areas.

Hardness

The hardness of a chromate film is usually equal to that of the metal on which it is deposited. Resistance to abrasion is poor, particularly with heavy coatings while still wet. Abrasion resistance is good after drying, and the treated surface can be stamped or cold drawn. Coatings will not stand up under continuous rubbing or abrading.

Porosity

Chromate coatings are absorptive immediately upon removal from the chromate solution. The heavier coatings such as bronze and olive drab can be dyed various colors. These colors are not lightfast and are used for identification or indoor exposure only.

Bonding

A. Organic Materials

1. The chromate coating provides a clean adherent surface act-

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- Automatic loading and unloading of parts from standard double-spine racks is available.
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- Where more than one cycle is required, machine can be made to include by-passing.

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ing as a corrosion protective barrier between the metal and subsequent organic coatings. It provides a basis for molecular rather than the mechanical adhesion obtained by use of crystalline type coatings.

2. Spot or seam welding of chromated zinc can be accomplished. Heavier coatings may necessitate use of higher amperage or chemical or mechanical removal of the film from the surface to be welded.

Fig. 5 — Two Chevrolet steel fender skirts zinc plated 0.0005 inch thick, buffed, zinc plated 0.0005 inch thick, treated with Iridite No. 8-P (1 to 5 mix) followed by a sodium carbonate bleach and baked-clear lacquer. Photo was taken after 4-year service test. (Photographs courtesy Allied Research Products, Inc., Baltimore 5, Maryland)

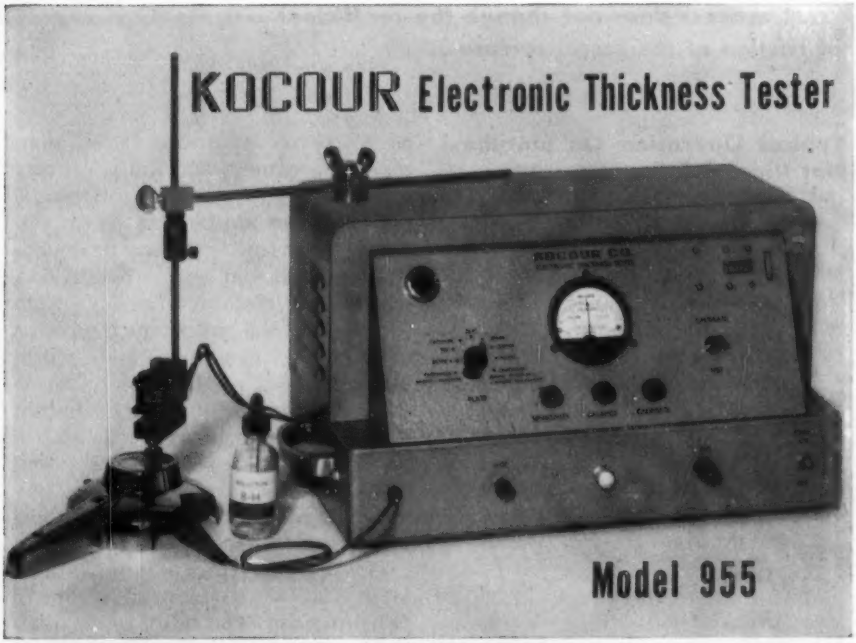
3. Soldering can be accomplished using normal acid fluxes. Where these cannot be used, mechanical removal of the chromate film will be necessary.

Film Dehydration

Dehydrating chromate films by baking at temperatures of 150 deg. F. or more, and subjecting to silica gel or calcium chloride in closed containers causes a change in structure of the coating. A crystalline coating occurs showing a pattern of chromium chromate when examined by x-ray diffraction. The film becomes relatively insoluble and the protective value is usually reduced under salt spray test.

Typical Operation For Strip Line Use

1. Galvanize.
2. Cool to 140 to 180 deg. F. in circulating air.
3. Chromate treatment.
   Immersion time range—2 to 6 seconds. Travel speed 200 to 250 feet per minute. Solution temperature 140 to 180 deg. F. obtained from warm strip. Solution controlled by checking pH by electrometric method. Solution maintained by addition of balanced compound and pH adjustments with acid.
4. Equipment—Tank and all submerged equipment, including rolls, stainless steel.
5. Warm spray rinse — 120-130 deg. F.
6. Squeegee.
7. Warm or cold circulating air to accelerate drying.



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". . . process does not change the coefficient of friction of the metal surface . . ."

Typical Operation On Standard Hot Dipped Galvanize

1. Clean if necessary.
   A. Optional
   Hot alkaline clean in caustic soda, 3 oz./gal. Temperature 150-180 deg. F. Time—30 to 60 seconds.
   B. Optional
   Room temperature acid clean in phosphoric acid—2 to 5 percent, butyl cellosolve—2 to 5 per cent, wetting agent—2 to 3 ml/gal., water remainder. Time—15 to 30 seconds.
2. Rinse.
3. Chromate treatment.
4. Rinse.
5. Rinse.
6. Dry air blast not to exceed 140 deg. F.

Present Use of Chromate Conversion Coatings on Hot Dipped Galvanize

Chromate conversion coatings at the present time are being used in a variety of interesting applications over hot dipped galvanize.

Pertinent Government Specifications covering their use are: General Spec.—Navy Ord. MIL-C-17711, General Spec.—MIL-12879, Type 1, Class 2—Base for paint. Type 2—Final finish.

Yellow iridescent coatings have found use as a corrosion protective final finish on galvanized angle iron used on TV towers, as well as on guy wire stakes for coastal radar units. Olive drab coatings are used as a corrosion protective, nonreflecting camouflage finish on guy wires for signal corps radar towers.

Clear films are being used on galvanized window frames to provide a bright finish and reduce white corrosion during storage.

At least one proprietary process is being used to produce a clear protective coating on mill sheet. One of the advantages of the process is that it does not change the coefficient of friction of the metal surface, and does not affect the forming characteristics in corrugating as do oils, waxes and other types of coatings.

One of the stranger applications is the use of a standard chemical polishing dip type solution, normally used on zinc plate for a clear bright finish, to remove burrs, flash, and so on, from hot dipped galvanized nuts and bolts. At the same time a corrosion protective coating is produced.

Iridescent yellow type coatings are being used as a base for paint on galvanized platforms for Texas Towers which are exposed year in and year out to the most corrosive conditions. The same type of process is also used on antenna masts for the Dew Line project of radar towers above the Arctic Circle.

Test Run on Chromate Conversion Coatings For Other Applications

Chromate conversion coatings can provide excellent paint adhesion. Bonding is due, however, to the molecular adhesion rather than to

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mechanical adhesion such as can be obtained by etching the galvanized surface. Therefore, the paint itself should have good adhesion characteristics in order to assure a satisfactory bond when used over a chromate coating. The coating will provide long lasting bonding under these conditions, eliminating paint to metal reactions. It also provides a corrosion protective layer between the paint and the galvanized surface, in the event that some of the paint is removed.

The following are results of an outdoor exposure test program run on galvanized panels, with and without chromate treatments.[4]

Site of the exposure was the roof of the Rheem Manufacturing Company plant at Sparrows Point, Maryland. Specimens were inclined at an angle of 45 deg. facing south. Atmosphere of the exposure was a composite of industrial, suburban, near both brackish and mild salt water. Total time of exposure was 3.3 years. Ratings were obtained through use of a bell-type adhesometer in kilograms.

Test No. 1 used a two-coat system of primer and finish of a typical synthetic baking enamel commonly used on the exterior of refrigerators. Results are listed in Table I.

Test No. 2 used two coats of iron oxide primer. Results are listed in Table II.

During the last war, it was found that plain hot dipped galvanized drums were the least serviceable for shipping gasoline. Traces of water in the gasoline itself, and that which enters through the closure by expansion and contraction, while water has accumulated on the head, causes the zinc coating to corrode. The hydrogen formed in this corrosion process releases bromine from the ethyl bromide content of the gasoline and causes excess deposition of lead in the engines, failing of spark plugs and corrosion of engine parts. The organic dye (quinone type) used for color identification of gasoline is also reduced from a blue to green to water white, thus confusing the purchaser. 91 Octane gasoline is tinted blue, 100 Octane green, water white, not defined.

Table I

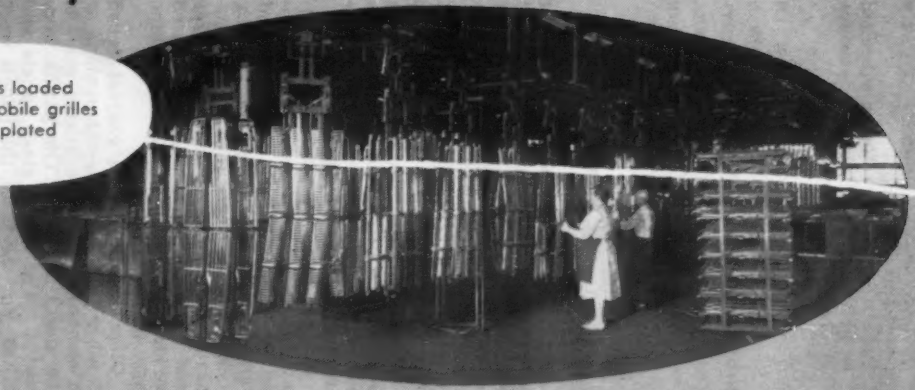
Test Panel	Rating
Mill galvanize—	
Untreated	2000
Plus Chromate 1	5000 plus
Plus Chromate 2	5000 plus
Plus Chromate 3	5000 plus
Plus Chromate 4	5000 plus
Plus Chromate 5	5000 plus
Hot dip galvanize—	
Untreated	1000 minus
Plus Chromate 1	5000 plus
Plus Chromate 2	5000 plus
Plus Chromate 3	5000 plus
Plus Chromate 4	5000 plus
Plus Chromate 5	5000 plus

Table II

Test Panel	Rating
Mill galvanize—	
Untreated	500 minus
Plus Chromate 1	5000
Plus Chromate 2	500
Plus Chromate 3	5000 plus
Plus Chromate 4	1000
Plus Chromate 5	500
Hot dip galvanize—	
Untreated	500 minus
Plus Chromate 1	1500
Plus Chromate 2	500
Plus Chromate 3	5000
Plus Chromate 4	500 minus
Plus Chromate 5	5000

For more data on advertisement on opposite page, circle 337 on Reader Service Card

A rack is loaded with automobile grilles to be plated



The Udylite Plating Machine at the Jackson, Michigan plant of Ryerson & Haynes, Inc., is fully automatic with automatic rack handling as an integral part of the machine.

The racks, loaded with grilles to be plated, automatically move from the plant conveyor to the Udylite machine to start the twenty step cycle of precision nickel and chrome plating.

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With automatic rack handling, chance of damage and human error are reduced to a seemingly impossible minimum. This is particularly important after nickel-chrome plating, when the grilles carry an investment of plating time and materials.

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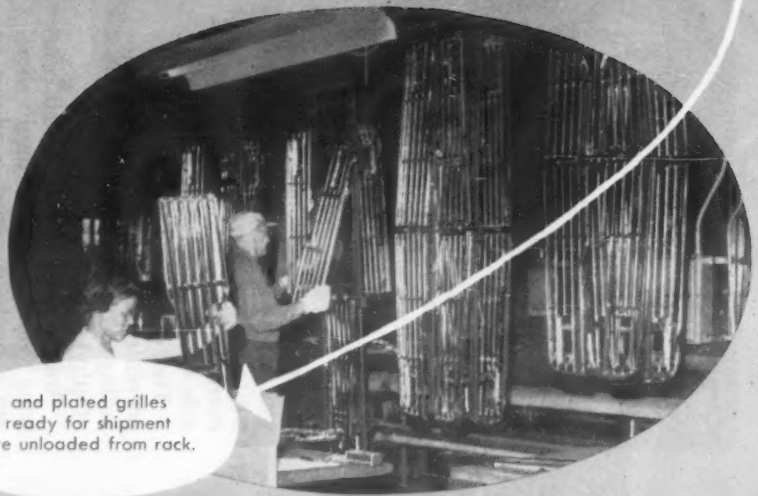

and plated grilles ready for shipment are unloaded from rack.

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A test was run by the Watson Laboratory on galvanized and chromated galvanized drums filled with 100 Octane gasoline stored outside for a period of 8 months.

At the end of this period, a considerable white deposit was observed in the bottom of the untreated drum, with a heavy deposit approximately one inch from the bottom and completely encircling the side wall. Minor white corrosion occurred on the remainder of the side wall exposed to the gasoline. Major white corrosion and red rust occurred in the vapor section of the side walls, top and fittings.

The chromated drum definitely prevented zinc salt formation, color fading of the gasoline and reduction of ethylene dibromide.

Another test run by an oil company* verified this, the results showing a badly corroded condition in an untreated drum and no corrosion in the chromated container. The Shell Company of Australia confirmed this test using mixtures of gasoline and distilled sea water in the tests.

Evaluation was made on the use of galvanized versus galvanized and chromated drums holding steam distilled turpentine.** At the end of a six-month test period, the plain galvanized drums showed a thin, general formation of white corrosion on the inside of the drum with a slight sediment of white salts on the bottom. The chromated container showed no white corrosion products or sediment.

* The Texas Company.
** Rausch Naval Stores Company, Inc.

REFERENCES

1. French Patent No. 708,346—April 28, 1931.
2. U. S. Patent No. 2,021,592—November 19, 1935—George Dubpurnell assigned to the Udylite Corporation.
3. U. S. Patent No. 2,035,380—March 24, 1936—Wilhelm assigned to the New Jersey Zinc Company.
4. From a preliminary report submitted to ASTM section C, sub V, committee B8—July 22, 1949.

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★ ★ ★

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Olive green silicone enamel failed in all resistance tests, either alone or in combination with a primer such as the zinc DBT paint. The paints were coated on stainless steel panels and baked. For the tests, the panels were passed through the blast flame at a speed of one inch per 10 seconds.

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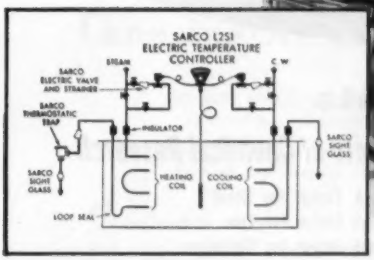
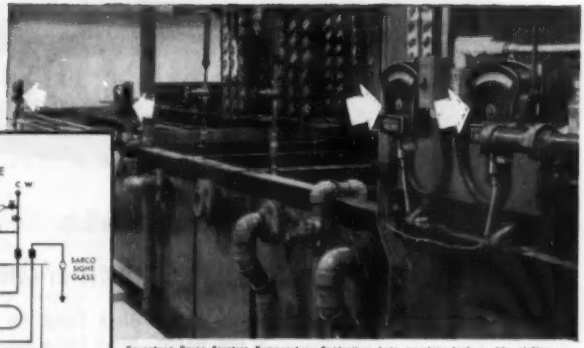




Seventeen Sarco Electric Temperature Controllers help maintain high quality plating—cut costs—at Ronson Corporation, Delaware Water Gap, Pa. Controllers are used on chrome, nickel, copper, silver, and gold plating tanks. This is a repeat installation.

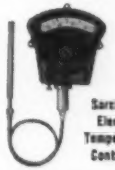
Improve plating quality—cut your costs with low-cost temperature control

Unstable bath temperatures . . . the result of erratic manual temperature control . . . are sure to lead to costly rejects, wasted man-hours and breakdown of plating solutions.

You can solve these problems at *low cost* . . . by installing always-reliable Sarco Automatic Temperature Control. Just think . . . a complete Sarco System is yours for as little as $130 a tank!

1. **You improve plating quality** because creeping temperatures are a thing of the past.
2. **You lower rejects** because solutions are held automatically to pre-set temperatures. No chance for human error to mess up a tankload . . . and cut into profits.
3. **You get better utilization of time** —platers are able to concentrate on their plating work. No worrying about bath temperatures. No turning on and off of valves.
4. **You save plating solutions** — because automatic control prevents boil-off caused by overshooting temperature.

Write for Bulletin 1025-B or consult your plating supplies jobber. Sarco Company, Inc., 635 Madison Avenue New York 22, N. Y.



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A COMPLETE SYSTEM FOR AS LITTLE AS $130 A TANK!

Think of it . . . automatic temperature control that often pays for itself in weeks!

Easy-to-read controller dial clearly indicates temperature being maintained. Temperature setting quickly changed by turning one knob.

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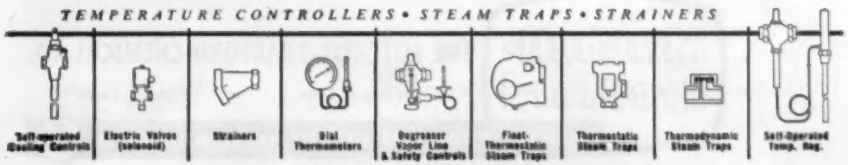
TEMPERATURE CONTROLLERS • STEAM TRAPS • STRAINERS



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A Timely Message on

Choosing A Career

That's Me!

by Sox von Liebestraum Sax
Ex Detroit Rep. and Assistant to
Ben P. Sax, Chairman of the Board
American Buff Company

It isn't often a dog ends up with my position, responsibility and supply of dog biscuits. It's all in how the bones bounce. Though, my sire, Champion Zarek von Liebestraum, vitally influenced my career choice.

Dear old Dad took me aside one day and filled me in on the "Birds and the Buffs." Long before American Buff was No. 1 in the industry, he said that there was a firm that was going to have the world by the buff sooner than later.

Heredity was "on my side," too. My fine old bloodline runs back so far it runs off the family tree. That's more than most dogs, or other German Shepherds for that matter, can say.

My final coup was adopting Stan Sax, our Sales Manager. After considerable training on my part, he's now a model master.

Choosing a career isn't half so easy as choosing the best Buffs on the market—American.

Cordially,

Sox von Liebestraum Sax

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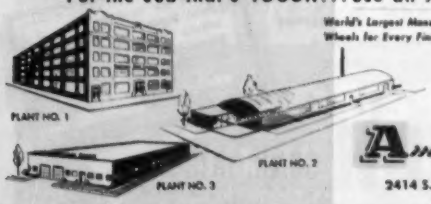
World's Largest Manufacturer of Buffs and Polishing Wheels for Every Finishing Operation.



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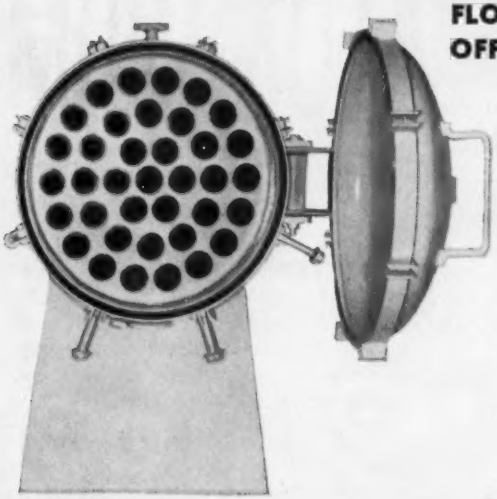

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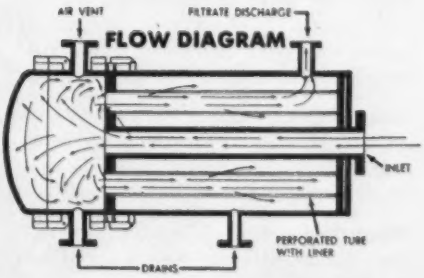
- ★ Unequaled simplicity of maintenance.
- ★ Solids can be recovered in dry form.
- ★ Liners are easy to replace and inexpensive.
- ★ Ideal for intermittent or continuous operation.
- ★ Chamber can be emptied without losing cake.
- ★ No unfiltered "heel."
- ★ Can be used with or without pre-coat.
- ★ Ideal for polishing . . . as a trap filter . . . and as a scavenger for larger filters.

NEW SIMPLIFIED OPERATION

The filter is prepared for use by simply rolling flat sheets of filter paper and inserting them in the tubes, which are designed to force the paper snugly against the tube wall.

EASY TO CLEAN . . . Filter papers are simply withdrawn and replaced. Even the tubes are easy to remove, held in place by a simple rubber O-Ring. Except for the cover there are no nuts and bolts to handle.



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ETCHING — Mil-Etch — Etches rapidly at low concentrations; gives uniform, fine-grained etch. No scale or sludge. Long life, simple control, no excessive foam or fumes, nondusty to handle.

CLEANING — Altrex* — Nonetching, heavy-duty soak cleaner with long life, high detergency. Excellent for cleaning before anodizing, chemical film treatment, or preparation for spot welding.

Spray-Altrex — Spray cleans without etching, has new low-foaming detergents. Easy to control, it works well in all kinds of water.

Wyandotte 468 — Neutral, solvent-type cleaner. Miscible with either hydrocarbon solvents or water. Removes oil, buffing compounds, drawing compounds without etching.

DESMUTTING — Wyandotte 2487 — Brightens aluminum alloys that darken in alkaline etching processes. Safer than acids; permits close control of desmutting bath. Easy-to-handle granular form; makes solutions of long life.

BRIGHTENING — I-2767-C — For brush or spray application; used as received or diluted with water. Brightens aircraft, truck trailers, aluminum equipment uniformly, rapidly without corroding surface.

Phos-It* — Liquid, phosphoric-acid-type product. Removes heavy corrosion quickly, brightens at the same time. Used diluted with water. For brush or dip application. Has high detergency, rapid action, low use-cost.

BARREL FINISHING — Altrex — For deburring and radiusing with stones or chips. Offers excellent cutting qualities and economy.

Burnek* 22 — For ball burnishing. Provides real economy for short and medium runs.

DEOXIDIZING — Wyandotte 2487 — Provides excellent preparation for spot welding. Gives uniformly low contact resistance on practically all alloys. No heat or close temperature control necessary. No appreciable surface etching. Work can be stored up to 96 hours before welding. Simple control.

best in products for FINISHING

PAINT PREPARATION—Pre-Fos* — Cleans and prepares all alloys for paint. Adaptable to spray-washer or soak-tank use. Surface is uniformly conditioned to provide superior paint adhesion and corrosion resistance.

Phos-It — Excellent for wipe-on, wipe-off cleaning and paint preparation. Gives fine etch or "paint tooth," which results in an excellent paint bond.

Dependable Wyandotte products give you better results, shorten maintenance time, reduce operating costs. Send for free technical literature on the Wyandotte products designed to fit your aluminum-finishing operations. Or call in a Wyandotte representative, today. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, Calif. Offices in principal cities.*

*REG. U.S. PAT. OFF.

PAINT STRIPPING — P-1075 — Fast-acting, nonflammable, room-temperature liquid paint stripper with a water seal. Removes most paint finishes without attacking aluminum. Economical — gives extra-long service life.

444-C — Removes paint from large parts or objects quickly. A thickened product for brush or flow-on stripping. Penetrates multiple coats of finishing materials with one application; is nonflammable, water rinsable.

Supersolve — Removes hard-to-handle enamels and other finishes quickly, without attacking metal. Used hot, diluted with water. Rinses easily.

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35th Annual Meeting

FEDERATION OF PAINT AND VARNISH PRODUCTION CLUBS

Bellevue-Stratford Hotel, October 30-November 2

The Bellevue-Stratford Hotel, convention headquarters, is located in the heart of historic Philadelphia, and many points of general and historic interest are located within easy walking distance from the hotel. Among these are Declaration Chamber, where the Declaration of Independence was adopted; Liberty Bell; Independence Hall; Betsy Ross House; Congress Hall; Carpenters' Hall; Franklin Institute; Philadelphia Museum of Art; Zoological Garden.

Milton A. Glaser
President

Dr. Joseph W. Tamecko
President-Elect

Howard G. Shell
Treasurer

Philadelphia, Pa.

Dr. Albert C. Zettlemoyer
Mattiello Lecturer

Dr. Roger H. Lueck
Keynote Speaker

C. Homer Flynn
Executive Secretary

Meeting

Wednesday, October 30

10:00 A.M.—Club Council Representatives Caucus.
11:00 A.M.-5:00 P.M.—Registration.
1:00 P.M.-5:00 P.M.—Paint Industries' Show.
1:15 P.M.—Federation Council Meeting.
7:00 P.M.-9:00 P.M.—Registration.

Thursday, October 31

8:00 A.M.-5:00 P.M.—Registration.
10:00 A.M.—Meeting Opens; Invocation—Verne C. Bidlack; Greetings—Milton A. Glaser, president; Welcome—P. J. Whiteway, Jr., chairman of Host Committee.
10:20 A.M.—"A Study of Pigment Dispersion: VI"—New York Club.
10:40 A.M.—"Solubility Parameters of Resins"—CDIC Club.
11:00 A.M.—"Description and Evaluation of Sag Tester"—Kansas City Club.
11:20 A.M.—"Evaluation of Dry Spackling Compounds for Interior Walls"—New York Club.
11:40 A.M.—Keynote Address. By Dr. Roger H. Lueck, vice president, Research and Technical Department, American Can Co.
12:00 Noon-6:00 P.M.—Paint Industries' Show.
12:30 P.M.—Canadian Luncheon.
North Dakota State College Alumni Reception.
2:00 P.M.—"Anti-Rust Additives in Primer Paints"—Golden Gate Club.
2:20 P.M.—Address by Joseph F. Battley, president of the National Paint, Varnish and Lacquer Association.
2:30 P.M.—"A Solvent Formulating Chart"—Roon Award Paper.
3:00 P.M.—Open Forum Session. Conducted by "Colonel" Billy Hood, of the Southern Paint and Varnish Production Club.
3:40 P.M.—"Color Stability of Red Iron Oxide Pigments"—Philadelphia Club.
4:00 P.M.—"Effect of Solvent Properties on the Viscosity of Alkyd Resin Solutions"—Roon Award Paper.
4:30 P.M.—Annual Business Meeting of the Federation; Report of Election and Announcements.

Friday, November 1

8:30 A.M.-4:30 P.M.—Registration.
9:00 A.M.-5:00 P.M.—Paint Industries' Show.
9:00 A.M.—"Instrumental Color Reproduction of Paint"—Baltimore Club.

Timetable

9:20 A.M.—"Selection of the Optimum Source of Artificial Illumination for the Matching of Colors"—Philadelphia Club.

9:40 A.M.—"Development of Flat Wall Paint Scrubbability Method"—New York Club.

10:00 A.M.—Panel Discussion—"Materials Handling"
W. S. Herner, moderator.....The Glidden Co.
M. Fenton.....American Marietta Co.
J. J. Hudson.....The Sherwin-Williams Co.
T. C. Ingram.....DeSoto Paint & Varnish Co.
C. A. Olson.....Hanna Paint Mfg. Co.

11:30 A.M.—The Annual Joseph J. Mattiello Memorial Lecture. "Pigment Vehicle Interface." By Dr. Albert C. Zettlemoyer, professor of chemistry, Lehigh University, and director of research, National Printing Ink Research Institute.

7:00 P.M.—Annual Banquet, Entertainment, and Dance.

Saturday, November 2

8:30 A.M.-Noon—Registration.

9:00 A.M.-3:00 P.M.—Paint Industries' Show.

9:00 A.M.—"Correction Factors Applied to the Carothers Equation for Condensation Polymerization"—Roon Award Paper.

9:30 A.M.—"Adhesion and Adhesives." By Dr. J. S. Long, W. L. Yuan, and R. J. Curran, of the University of Louisville Institute of Industrial Research.

9:50 A.M.—"Solvent-free Epoxy Amine Systems." By Dr. G. H. Ott, of Ciba Limited, Basle, Switzerland. (Paper sponsored by the Federation of the Associations of Technicians in the Paint, Varnish, Lacquer and Printing Ink Industries of Continental Europe.)

10:30 A.M.—Panel Discussion. "An Approach to Formulation."
Wilbert L. Gore.....E. I. du Pont de Nemours & Co., Inc.
Edward J. Dunn, Jr., moderator.....National Lead Co.
Professor Herman Wagner.....Rutgers University

2:00 P.M.—"Use of Hexylene Glycol and Other Solvents in Styrene-Butadiene Latex Paint"—Roon Award Paper.

2:30 P.M.—"Development and Use of the Sand Grinder"—David G. Bosse, E. I. duPont de Nemours & Co., Inc.

3:30 P.M.—35th Annual Meeting Closes.

Ladies' Program

The Ladies Program includes a bus tour of historic Philadelphia on Thursday afternoon, including visits to Independence Hall, Betsy Ross House, Old Christ Church, and other places of interest; and a visit to Longwood Gardens in Kennett Square, Pa., on Friday afternoon. These beautiful Arboretum and flower gardens, with their great variety of plant species, rank as one of the nation's most distinguished show places. Developed by the late Pierre S. du Pont, the Gardens have been a popular attraction since 1921. A luncheon for the ladies is planned after this tour.

★ ★ ★

1957 Joseph J. Mattiello Lecture

Dr. Albert C. Zettlemoyer, professor of chemistry and research director of the National Printing Ink Institute at Lehigh University, has been selected to present the Annual Joseph J. Mattiello Lecture.

The title of his lecture, which will be the feature technical presentation of the Annual Meeting, will be "The Pigment-Vehicle Interface."

The Mattiello Lecture, instituted by the Federation in 1949, commemorates the name of Joseph J. Mattiello, who, as a member of the Federation, did so much to expand the application of the science in the protective coatings field. The Federation committee which made the selection of Dr. Zettlemoyer included W. E. Santoro, chairman, (New York Club); C. A. Aloia (New York Club); H. P. Ball (Pittsburgh Club); H. E. Hillman (New York Club); and W. B. Pierce (New England Club).

Dr. Zettlemoyer was awarded the degree of Doctor of Philosophy in Physical Chemistry by the Massachusetts Institute of Technology. During his undergraduate and graduate years, Dr. Zettlemoyer was the recipient of a number of teaching fellowships and awards for academic achievement.

He became an instructor in chemistry at MIT in 1940-1941 and then joined the Research Division of the Armstrong Cork Co. as a research chemist. Shortly thereafter he resumed his teaching career at Lehigh University as an instructor, was promoted to assistant professor in 1943, to associate professor in 1946, and to full professor in 1950.

Dr. Zettlemoyer has published some seventy articles on the results of his work as a research director and teacher. He is the author of several chapters in books on rheology and surface chemistry and presently holds five patents and six patent applications. He has traveled widely as lecturer and teacher throughout the United States and in Japan and Europe.

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Formulators with know-how start with Dow Alkali as the base in their top-quality metal cleaning compounds. Why? Because Dow Alkali delivers the high cleaning power they need. Formulations containing Dow Caustic Soda Flake and Dow Sodium Orthosilicate clean fast and thoroughly, leave metal parts and products free of dirt, grime and grease. Many plants have cut operating costs and increased efficiency by switching to a topnotch alkali cleaner made with Dow products. Why not give it a try? THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. AL607L-2.

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Lacquer Information Center

For the sixth successive year a Lacquer Information Center will be a feature of the annual Paint Industries Show.

The exhibit is being presented through the cooperative effort of suppliers of basic raw materials for lacquer. It will depict the latest developments in lacquer technology, formulations, and application.

The companies which are cosponsors of this year's Lacquer Information Center include Antara Chemicals Division, General Aniline & Film Corporation; Celanese Corporation of America; Columbian Carbon Company; Davison Chemical Company, Division of W. R. Grace & Company; Enjay Company, Inc.; Hercules Powder Company; Olin Mathieson Chemical Corporation; Shell Chemical Corporation; Union Carbide Chemicals Company, Division of Union Carbide Corporation; and William Zinsser & Company, Inc.

Technical representatives from the cosponsoring companies will be available at all times to discuss specific problems and a complete file of literature and technical data will be available.

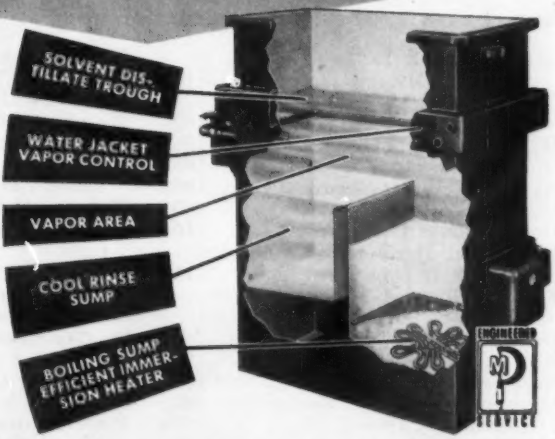
List of Exhibitors in 1957 Paint Industries Show

All exhibits are in Bellevue-Stratford Hotel

Firm	Booth No.
Abbe, Paul O, Inc.	210
Advance Solvents & Chemical	217-218
Ambrose Co., C. M.	209
Anderson-Prichard Oil Co.	1858
Archer-Daniels-Midland Co.	211-212
Atlas Electric Devices Co.	105
Bakelite Co.	201-202-203
Baker Castor Oil Co.	1821
Barrett Div., Allied Chemical & Dye Corp.	1811-1813
Bennett Industries, Inc.	1877
Borden Co., Chemical Div.	1809-1810
Buckman Laboratories, Inc.	118-119
Cabot, Inc., Godfrey L.	1871-1873
Cambridge Industries Co.	1827
Carbola Chemical Co., Inc.	108
Carbon Dispersions, Inc.	107
Cargill, Inc.	1829
Catalytic Combustion Corp.	1807
Celanese Corp. of America, Chemical Div.	219-220
Celanese Corp. of America, Plastics Div.	1833
Cellofilm Industries Inc.	207
Ciba Co., Inc.	1837
Colton Chemical Co.	1874-1876
Columbian Carbon Co.	1843
Commercial Solvents Corp.	1817-1819
Cuno Engineering Corp.	206
Daniel Products Co.	1803
Day Co., J. H.	112-113
Dewey & Almy Chemical Co.	1866
Dow Chemical Co.	1845-1847-1849
Dow Corning Corp.	1850
duPont de Nemours & Co., Inc.	1869
Eastman Chemical Products, Inc.	1861-1862
Farnow, Inc.	1870
Firestone Plastics Co.	1875
General Electric Co.	1856
General Mills, Inc., Chemical Div.	102

This compact, versatile degreaser proves ideal for efficient, economical production in smaller plants or departments

Now any plant can have production vapor degreasing



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This vapor degreasing economy may be just what you're looking for. With such a low original investment it is possible for every plant to have vapor degreasing—the *modern* metal cleaning method.

The 100 CS is a *complete* degreaser. You get cool and hot rinse, along with vapor degreasing. In addition, the 100 CS also operates as a solvent recovery still at seven gallons per hour. (This rate is based on a 30% contamination of solvent).

The Phillips 100 CS operates economically on either a *continuous or intermittent basis, handling many production or maintenance jobs quickly and inexpensively.* Check into this low cost unit today.

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All essential information on 100 CS specifications and electrical characteristics.

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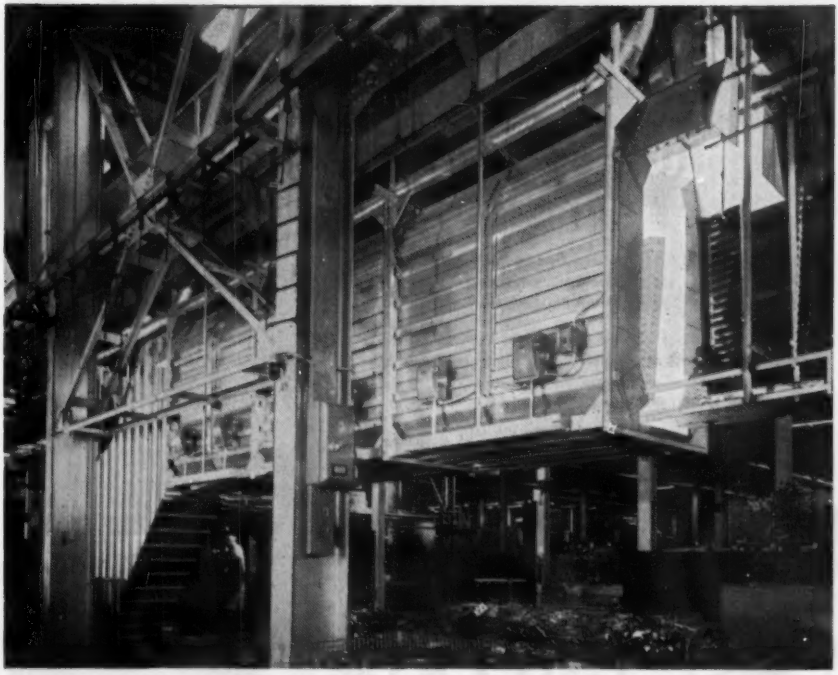
Firm	Booth No.
General Tire & Rubber Co., Chemical Div.	106
Goodyear Tire & Rubber Co.	1822-1824-1826
Harshaw Chemical Co.	1831-1832
Hercules Powder Co.	1835-1836
Heyden Newport Chemical Co.	1863
Hilton-Davis Chemical Co.	1801
Hockmeyer & Co., Herman	104
Instrument Development Labs Inc.	
International Talc Co., Inc.	111
Kellogg, Spencer & Sons, Inc.	1854-1855
Kent Machine Works, Inc.	1840
Kinetic Dispersion Corp.	208
Koppers Co., Inc.	1846-1848
Lacquer Information Center	1864-1865
Lehmann Co., Inc., J. M.	1820
Macbeth Daylighting Corp.	120
Metals Disintegrating Co., Inc.	1815
Mineral Pigments Corp.	221
Mineral & Chemicals Corp. of America	1818
Mobay Chemical Co.	1842-1844
Monsanto Chemical Co., Plastics Div.	1823-1825
Morehouse Cowles, Inc.	1830
Naftone, Inc.	1859
National Aniline Div., Allied Chemical & Dye Corp.	1857
National Paint, Varnish and Lacquer Association	(Stage—Burgundy Rm.)
Neville Chemical Co.	1812-1814
Nopco Chemical Co.	1860
Nuodex Products Co.	1805-1806
Oronite Chemical Co.	114
Patterson Foundry & Machine Co.	204-205
Pennsalt Chemicals Corp.	1837B
Pennsylvania Industrial Chemical Corp.	1868
Q-Panel Co.	
Raybo Chemical Co.	1828
R-B-H Dispersions	200
Reichard-Coulston, Inc.	115
Reichhold Chemicals, Inc.	1851-1852-1853
Rohm & Haas Co.	1839-1841
Ross & Son Co., Inc., Charles	121
Ross & Rowe, Inc.	1816
Shawinigan Resins Corp.	1838
Shell Chemical Corp.	116-117
Shell Oil Co.	109-110
Silberline Manufacturing Co., Inc.	1867
Sparkler Manufacturing Co.	1872
Thibault & Walker Co.	1878
Troy Chemical Co.	1802
Troy Engine & Machine Co.	101
Union Bag-Camp Paper Corp.	1834
Union Carbide Chemicals Co.	213-214
U. S. Stoneware Co.	103
Velsicol Chemical Corp.	1808
Williams & Co., C. K.	1804
Witco Chemical Co.	215-216

ODUCTS FINISHING Magazine

"Listen! I have a grievance to report."

★ ★ ★

Speeding was blamed for 13,830 deaths on U. S. highways in 1956.



Fostoria Radiant Oven at Westinghouse, Columbus, Ohio

PROCESSES 24,000 PARTS EVERY WEEK

It takes only 15 minutes to dry refrigerator back-plate condensers for stacking—at the Columbus, Ohio Westinghouse plant, a recent addition to the company's Electric Appliance Division.

Using a fast-drying Fostoria Radiant Oven, this modern plant is able to process 10,000 to 12,000 condensers for major appliances, plus the same number of miscellaneous small parts, every 5-day week. In thousands of similar industrial applications, Fostoria Radiant Ovens speed up production, save valuable man-power . . . and cut operating costs as much as 50%. Fostoria design permits overhead installation to save work space (as shown above) and allows easy relocation, if necessary. Want to know how an efficient Fostoria Radiant Oven can save money and improve product quality *for you?* Send for complete details today!

Write for free, fact-filled booklet— "Applications Unlimited"

INFRA-RED fostoria SYSTEM

FOSTORIA PRESSED STEEL CORPORATION • Dept. 1022, Fostoria, Ohio

Pioneer manufacturer of radiant equipment—from components to complete ovens

For more data circle **348** on Reader Service Card

Specialists in the Unusual

Rhodium
ELECTROPLATING SOLUTIONS

Technological knowledge acquired through many years of experience, plus special processes and equipment, assure the high quality of our Rhodium Plating Solutions.

Recommended for contact surfaces of switches, waveguide parts and other electrical applications, such as printed circuits...Can be applied in extremely heavy deposits, up to 100 milligrams per square inch.

Rhodium plating provides the advantages of whiteness, lustre and corrosion resistance of a precious metal.

Consult our staff, without obligation, about your specific plating problems.

SIGMUND COHN MFG. CO., INC.
121 SOUTH COLUMBUS AVENUE • MOUNT VERNON, NEW YORK

SINCE 1901

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BISON CORPORATION

BUFFS

Air-cooled VENTEX buffs, with permanent or removable metal centers are available for every job!

BUFFS • CLEANERS
COATED ABRASIVES
POLISHING WHEELS
ANODES • HEAT TREATING PRODUCTS
EQUIPMENT AND SUPPLIES •
COMPOSITIONS

Precision manufactured on latest, modern equipment in the BISON Canton plant — assuring uniform quality.

Distributors, jobbers! Territories open! Write for details!

COMPLETE SERVICE FOR METAL FINISHING

Bison Corporation

1935 ALLEN AVENUE S. E. • CANTON, OHIO

• INDUSTRIAL CHEMICALS •
• ACIDS • SOLVENTS • ALKALIES
WAREHOUSE STOCKS OR TRUCKLOADS DIRECT

PHONE
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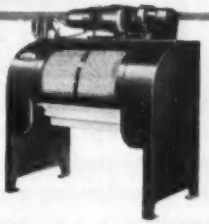
For more data circle **350** on Reader Service Card

ALMCO

has the right barrel finishing equipment for you!

MULTI-COMPARTMENT BARRELS

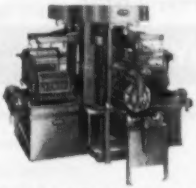
For a wide variety of parts or small quantity runs where fixtures would be too costly. Ideal for short to medium cycle runs that permit re-use of compounds. These custom designed barrels have automatic forward and reverse, any combination of compartments or doors.



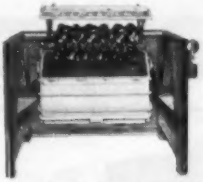
ALMCO'S "ADVANCED DESIGN" SERIES

Thirteen great models in this series! These machines feature a wide range of variable speeds (infinite from 6 to 30 r.p.m.), making possible economical deburring and finishing of the greatest variety of parts.

SUB-O-MATIC AUTOMATED SYSTEMS

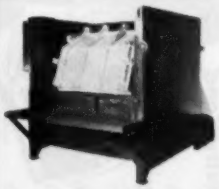


Almco's exclusive submerged unit is an automatic, "assembly line" system for micro-precision deburring and finishing of small parts in quantity. Saves labor, speeds up processing and flow of high production parts. Slashes compound expense to minimum.



"FIXTURE" TYPE BARRELS

Pioneered by Almco for processing large and intricate parts. Custom designed fixtures hold parts securely, prevent part-on-part impingement and allow abrasive action to reach all surfaces, cavities, slots, etc. Automatic forward and reverse controls.



CUSTOM-DESIGNED BARRELS

Almco designs and manufactures special barrels of all types for problems where standard equipment cannot be effectively used. These range from the smallest type to the largest fixture barrel such as the 60" diameter x 60" length barrel shown above. Special large triple flat doors are also available.

SMALLER MACHINES

Twin barrel machines manufactured by Almco are the standard of the industry for shops processing small lots of parts and for companies with large lots of small parts. Also ideal for sample processing, barrel finishing research and development work, and as auxiliary equipment.

Send in Your Sample Parts

Your sample parts processed without obligation in a modern Almco test lab! Simply write on letterhead for address of nearest Almco lab or send parts direct to Albert Lea, Minn. Enclose specifications desired. Complete free report includes recommendation. 52 PAGE BARREL FINISHING HANDBOOK SENT ON REQUEST.

ALMCO

DIVISION OF QUEEN STOVE WORKS, INC.

810 Marshall Street • Albert Lea, Minnesota

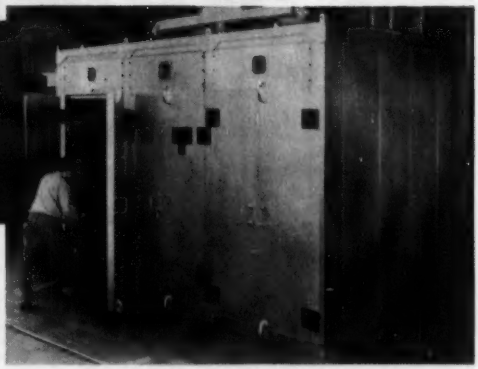
Sales and Engineering Offices in Chicago, Detroit, Los Angeles, Newark, New Haven and Philadelphia

IN ENGLAND: Almco Division of Great Britain, Ltd., Bury Mead Works, Hitchin, Herts, England

For more data circle **351** on Reader Service Card

You're SURE of UNIFORM Drying—FAST

ROCKWELL Recirculating OVENS



Uniform distribution of controlled, high velocity, recirculated, heated air assures faster drying or baking at precise temperature.

Investigate the oven with the built-in heating "know-how." Write for Catalog.

Made in wide range of standard electric-, gas-, oil- or steam-heated, cabinet, rack or truck types and in special batch or conveyor types.

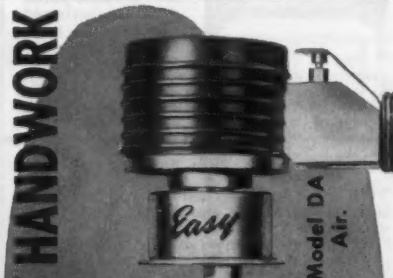
W. S. ROCKWELL COMPANY 2907 Eliot Street, Fairfield, Conn.

For more data circle **352** on Reader Service Card

STOP COSTLY HANDWORK

Easy LICKS TOUGH JOBS WITH DUAL-ACTION

HEAVY GRINDING, SANDING, DEBURRING TO MICRO-FINISHING



COLD FINISHING

Dual Action eliminates surface heat. Stops heat damage, speeds the job and cuts abrasive costs to 75%.

Tops for white metal slick-up. Removes swirls, smooths solder. Sanding surfacer, putty, and spotting rejects.

Ask your Jobber for Demo. or write

Model DF Electric.

Model JR Air.

DUAL-ACTION OR STRAIGHT LINE. AN *Easy* FOR EVERY JOB.

DETROIT SURFACING MACHINE CO.

For more data circle **353** on Reader Service Card

HAVE YOU OVERLOOKED USING RINS-AID?

RINS-AID provides a water-repellent surface on freshly plated parts that makes almost all of the water flow instantly from the surface before staining occurs. Among the applications reported by users (which may suggest valuable uses to you) are:

TO PREVENT STAINING, TARNISHING AND FACILITATE DRYING—

- Automobile Bumpers
- Micrometer Assemblies
- Silver Plated Electrical Contact Mechanisms
- Complicated Cadmium Plated Assemblies
- Copper Plated Hardware
- Steel Springs
- Tubing—outside and inside

FOR COMPLETE DRAINAGE AND FREEDOM FROM NICKEL OR CHROMIC ACID SALTS FOR POSITIVE ELECTRICAL CONTACT—

- Telescoping Auto Antennae

FOR PREVENTING RUSTING OF UNPLATED AREAS—

- Steel Parts

WHAT ARE THE AMAZING QUALITIES OF RINS-AID?

RINS-AID imparts a buffed appearance to chrome; gives a uniform, velvety appearance to cadmium; eliminates cut-through buffing of stained parts; in many cases eliminates special drying; removes water from the inside of tubes and other inaccessible areas, and makes active electropolished or bright dipped surfaces dry better without staining. It also provides an excellent way to prevent tarnish and add shelf-life to all plated articles. ONLY 2 TO 20 FLUID OUNCES OF RINS-AID ARE REQUIRED PER 100 GALLONS OF WATER.

FREE—ONE QUART TRIAL OFFER!

Enough to demonstrate, under your own plating conditions, what RINS-AID does.

R. O. HULL & COMPANY, INC., 1304 Parsons Ct., Rocky River 16, Ohio

ROHCo

R. O. HULL & COMPANY, INC.
1304 Parson Court
Rocky River 16, Ohio

Yes, send FREE, ONE QUART TRIAL OFFER of RINS-AID! No obligation, whatsoever.

Name ..... Title.....

Company .....

Street Address .....

City..... Zone..... State.....

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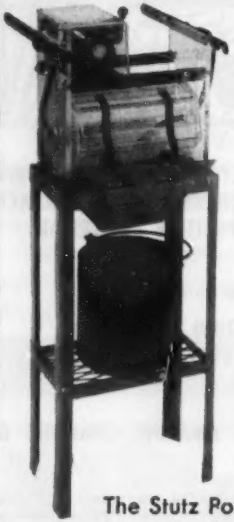
STUTZ



PORTABLE PLATING BARRELS

The Stutz Portable Barrel is made in 2 standard sizes with cylinders having inside dimensions of 6" x 12" and 8" x 18", I.D., and smaller upon application. Standard openings are 3/32". Smaller or larger openings can be furnished as required.

★ Baskets in perforated metals or wire mesh.

★ Load/Unload Stand for convenient and fast handling of work load.

We invite your inquiries.

THE STUTZ CO.

4410 Carroll Ave., Chicago 24, Ill.

Serving Industry 35 Years

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Make Sure it Sticks

. . . use

SEA-LAC RV 3389

Alloy Primer

Here's the bonding agent that has what it takes to stick to cadmium, zinc, galvanized steel, aluminum . . . and other metals. Works well under vinyl, acrylic, butyrates, conventional lacquer and baking enamels.

DURALAC CHEMICAL CORP.

84 LISTER AVENUE, NEWARK 5, N. J.

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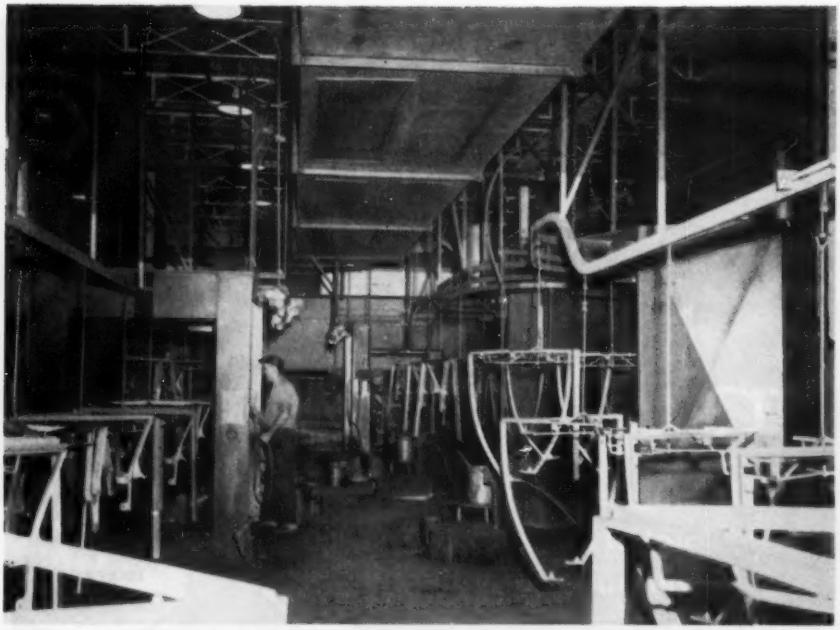


R-W "Zig-Zag" Conveyors provide fast and efficient finishing of auto window frames

An R-W "Zig-Zag" Conveyor, shown above, quickly and efficiently carries automotive window frames through a complete finishing operation...cleaning, dry-off, electrostatic spray painting, hand reinforcing and baking. This system, installed in the North Vernon Industries plant at North Vernon, Indiana, is 1125 feet long with racks spaced on 4½ foot centers and can be set to travel from six to twelve feet per minute.

Today's competitive market makes fast, efficient materials handling a *must* and production efficiency demands a constant flow of materials and maximum use of all available space. R-W "Zig-Zag" Conveyors effectively meet these demands by keeping things moving on the production line and utilizing, to full extent, valuable overhead space. R-W "Zig-Zag" Conveyors are extremely flexible...easily move up, down, in, out and around...carry unit loads up to 125 lbs. at speeds from one inch to 100 feet per minute. "Zig-Zag" systems may be easily altered, expanded or relocated by plant personnel.

See the "Painting Automotive Window Frames" story in this issue for additional information on the above installation.

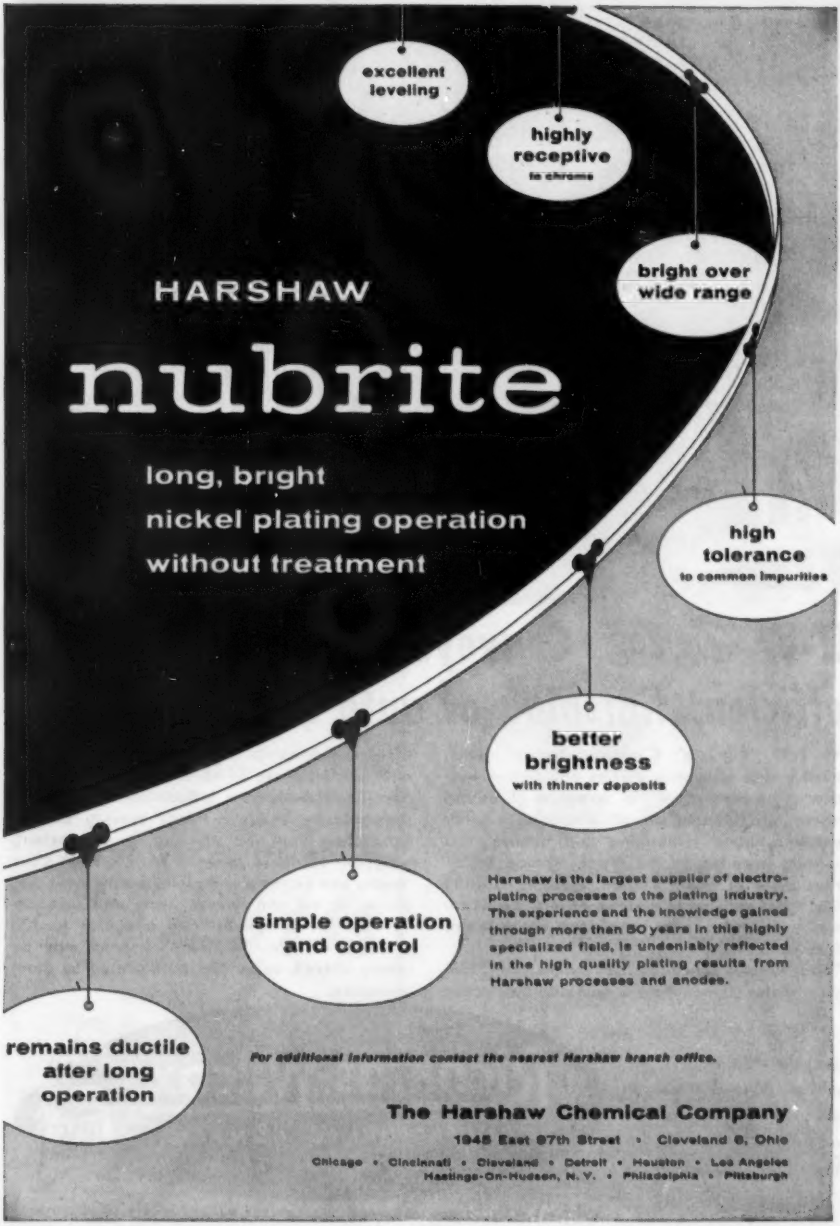
Richards-Wilcox

MANUFACTURING COMPANY

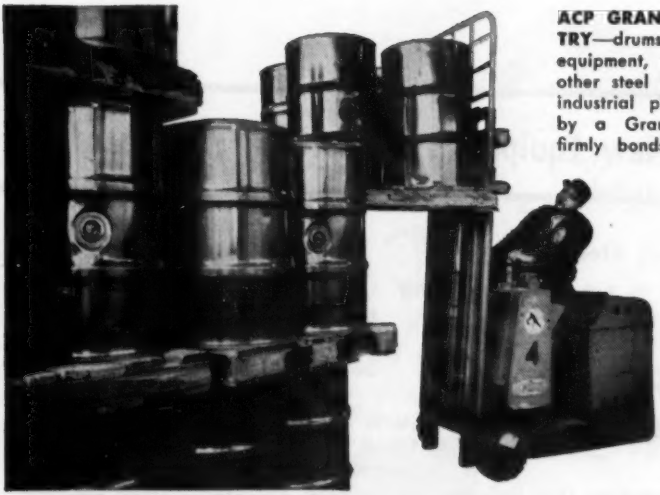
"MATERIAL HANDLING DIVISION"

100 W. THIRD ST., AURORA, ILLINOIS • Branches in Principal Cities

For more data circle **357** on Reader Service Card


excellent leveling
highly receptive to chrome
bright over wide range
HARSHAW
nubrite
long, bright
nickel plating operation
without treatment
high tolerance to common impurities
better brightness with thinner deposits
simple operation and control
remains ductile after long operation
Harshaw is the largest supplier of electroplating processes to the plating industry. The experience and the knowledge gained through more than 80 years in this highly specialized field, is undeniably reflected in the high quality plating results from Harshaw processes and anodes.
For additional information contact the nearest Harshaw branch office.
The Harshaw Chemical Company
1945 East 97th Street • Cleveland 6, Ohio
Chicago • Cincinnati • Cleveland • Detroit • Houston • Los Angeles
Hastings-On-Hudson, N. Y. • Philadelphia • Pittsburgh

For more data circle 358 on Reader Service Card



ACP GRANODINE IN INDUSTRY—drums, materials handling equipment, and a great many other steel products throughout industrial plants are protected by a Granodine base which firmly bonds the paint.

ACP *Granodine*®—BASE FOR DURABLE PAINT FINISHES ON DRUMS, MATERIALS HANDLING EQUIPMENT, AND OTHER STEEL PRODUCTS USED IN INDUSTRIAL PLANTS

IN THE HOME—ranges, refrigerators, freezers, washers and dryers are among the many products whose sparkling finish is firmly anchored to the metal by an ACP Granodine coating.

ACP Granodine firmly bonds the paint finish on many steel products used in industrial plants, giving them lasting protection by converting the surface to a nonmetallic phosphate coating. This chemically deposited film greatly increases the adhesion of the finish and also provides high corrosion resistance—even when used in conjunction with a relatively thin and flexible paint film.

LEARN MORE ABOUT ACP GRANODINE. Bulletin 1380 describes the various types and gives information which will help you select the proper one for your particular application. Write for your copy today.

AMERICAN CHEMICAL PAINT COMPANY, Ambler 14, Pa.

DETROIT MICH. • ST. JOSEPH, MO. • MILES, CALIF. • WINDSOR, ONT.

CHEMICALS ACP PROCESSES

New Chemical Horizons for Industry and Agriculture

For more data circle 359 on Reader Service Card

New Equipment, Materials, Processes

Cleaning
Polishing
Plating
Paint Finishing

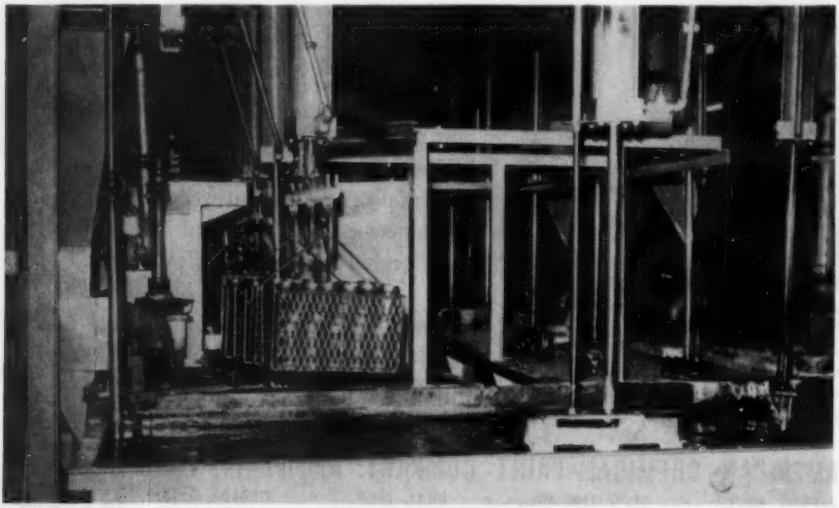
Automatic Dipping Machine

A dip-process machine that indexes automatically for multiple-stage finishing operations has been developed by Cincinnati Cleaning and Finishing Machinery Co., Cincinnati, Ohio.

This machine permits the use of shorter dip tanks; it dips baskets of parts in a series of tanks as baskets travel suspended from a single, closed-loop monorail conveyor. The operation is entirely automatic, from the first dip through conveyor unloading. The unit can be used in any dip process.

The machine's tanks are only long enough to permit entry and processing of parts.

The conveyor automatically moves



Cincinnati Cleaning Automatic Dip-Process Machine: transfers baskets from tank to tank

America looks to . . . Hammond

for

FINISHING and DEBURRING "KNOW-HOW"

The experience gained in over 70 years of machinery building has provided us with a big bank of "Know How."

This knowledge is drawn upon and added to every day. Our business is to share it with you to bring down high finishing costs. Many users of Hammond Automatics have found more efficient means of finishing by drawing on our bank of "Know How."

The Rotary Automatic illustrated represents one of our many types and sizes of automatic finishing machines for either continuous rotation or indexing. The head and stand units shown are a part of a large "family" which range in type and size up to 20 HP.

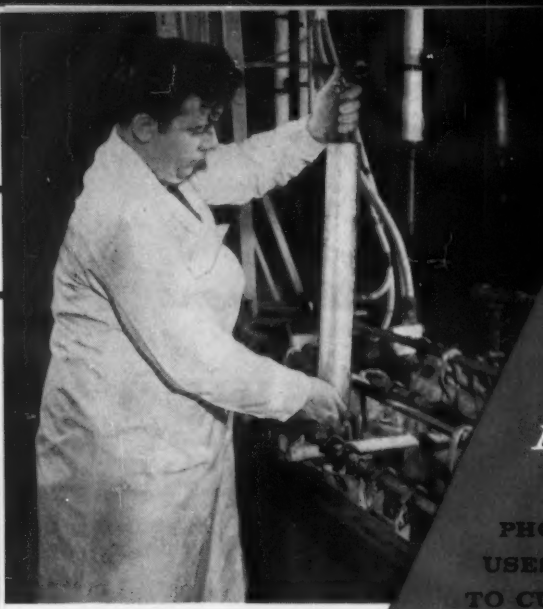
SEND SAMPLES and we will show you how much you can speed up production and cut costs.

Hammond Machinery Builders INC

1622 DOUGLAS AVE. • KALAMAZOO, MICH.

See us at Booth 1311, National Metal Exposition, Nov. 4-8

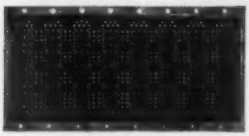
For more data circle **360** on Reader Service Card



PLATING PROBLEMS
IN INDUSTRY—NO. 1

PLATING THROUGH HOLES

PHOTOCIRCUITS CORP. USES OFHC® COPPER ANODES TO CUT FIELD REJECTS BELOW 0.01%



Printed circuits consist of electrically conductive patterns bonded to an insulator base. For plated-through holes in printed circuits, Photocircuits deposits 0.002-inch copper followed by approximately 0.001-inch solder or 0.0005-inch silver.

Plated-through holes make the best electrical connections between two sides of a printed-circuit board—if there is *uniform plating coverage* of the hole. That's why Photocircuits Corporation, a major designer-manufacturer of printed circuits, copper-plates *exclusively* with OFHC Brand Copper Anodes.

Photocircuits plating men found that conventional copper anodes require costly techniques for uniformly plated-through holes. But with OFHC Copper Anodes, accelerated and simplified procedures became feasible—with such good results that rejects for plated-hole failure in the field are now less than 1 in 10,000.

OFHC Copper Anodes give more uniform plating because OFHC Copper—produced exclusively by AMCO—is free of anode impurities. OFHC Copper is 99.99+% pure, contains no oxides, no deoxidants.

To find out how the extreme purity of OFHC Copper Anodes can benefit your own electroplating operation, contact your distributor or our nearest office directly.

THE AMERICAN METAL CO., LTD.
61 Broadway, New York 6, N. Y.

BOSTON — CHICAGO — DETROIT — LOS ANGELES

baskets of parts from tank to tank, and automatically submerges them for processing. The automatic indexing is actuated by a floating cam which operates air cylinders spaced at 48 inches o.c. throughout the length of the conveyor system. Air cylinders are supplied from a single flexible manifold attached from cylinder to cylinder, which is in turn supplied from a rotating hose in the center of the system. Volume of air required for specific operations is determined by the size of the air cylinders. An electric timer controls the indexing operation of the conveyor.

The use of stainless steel, lead, and rubber tanks makes this unit useful for pickling processes.

Complete details on the indexing monorail dip process machine are available from the manufacturer, Cincinnati Cleaning and Finishing Machinery Co., 2008 Hageman St., Cincinnati 41, Ohio.

For more data circle 1 on Reader Service Card

★ ★ ★

Small Polishing-Grinding Wheels

Disposable flanges and a design that permits flush sanding are two improvements in the line of small coated abrasive "PG" (polishing and grinding) wheels recently introduced by Minnesota Mining and Manufacturing Co., St. Paul, Minn.

The disposable flanges, which lock the wheel's coated abrasive leaves securely in place, are factory-installed and bonded to the core. This construction technique makes it unnecessary to remove the flanges when a wheel change is required; it's simply a matter of slipping the "PG" wheel on the spindle and tightening the cap nut. Performance characteristics of the wheel remain unchanged.

In addition to offering the user faster wheel changes, and eliminating the

Fig. 1—Simple adapter kits, such as the one shown above, containing a washer and an end cap nut, easily fit the recessed flange of "PG" wheel to spindle of any lathe.

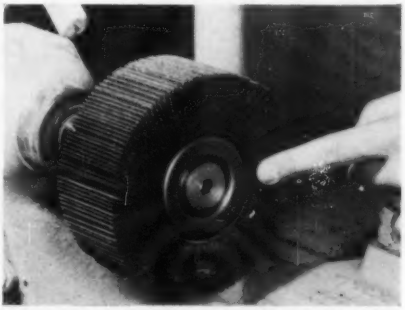


Fig. 2—This is small "PG" wheel with recessed flange and end cap nut for use against flush surfaces. The working surface of the wheel is on the perimeter; recessed side allows butting against flush surfaces. Steel flange is bonded into position, cannot come loose from wheel, and is thrown away with the core when the wheel is worn.

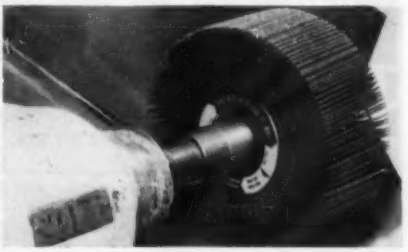


Fig. 3—Attached to a bench lathe, the recessed flange "PG" wheel is readily available for off-hand operations "head-on," or those requiring a finish into a corner.

←———For more data on advertisement on opposite page circle 361 on Reader Service Card

necessity for stocking extra flanges, the disposable flanges provide greater hub strength, the manufacturer states.

Another feature of the newly designed wheels is that the flanges are recessed into the side of the wheel. The end cap nut is also recessed, so that the wheel can be used flush against a surface, as in finishing a right angle or corner.

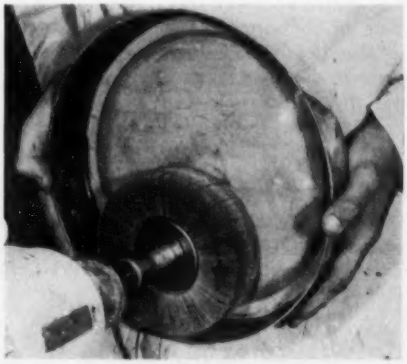
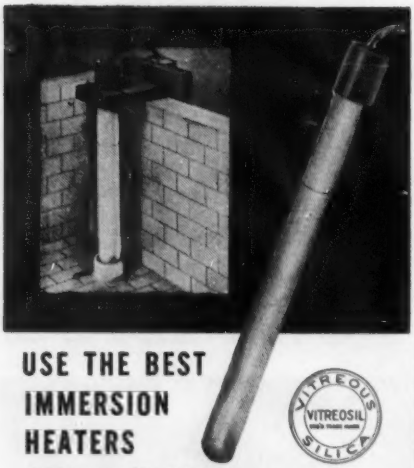


Fig. 4—"PG" wheel works well for contour sanding, where the end of the wheel must be in contact with a flush surface. It quickly takes the contour of the area being finished and holds that contour until reshaped.

The recessed-type flange also allows the wheels to be ganged more closely together to obtain a wider abrasive surface.

The recessed flanges are available on all diameters of the small (6 inches through 10 inches diameter) "PG" wheel line, and on widths 1½ inches and up.

Specifications for the flanges include a standard one-inch center hole on wheels 6 inches in diameter; and a standard 1¼-inch center hole on wheels with a 7, 8, 9 or 10-inch diameter. Wheels 11 inches and larger—



USE THE BEST IMMERSION HEATERS

VITREOSIL VITREOUS SILICA

U.S. Patent No. 2,654,820

Compact, safe and efficient, VITREOSIL® electric immersion heaters offer you your most dependable units. Designed for acid pickling and electroplating solutions and other acid baths, VITREOSIL heaters give greater heat transfer per unit area and greater resistance to chemical attack.

VITREOSIL immersion heaters are made of pure fused silica and have special corrosion-resistant caps, built-in ground wires for additional protection and easily visible minimum immersion depth markings.

VITREOSIL immersion heaters will serve you best. Write for bulletin and prices.

THERMAL AMERICAN FUSED QUARTZ CO., INC.
18-20 Salem Street, Dover, New Jersey

Please send illustrated bulletin or information on_____

_____

Company_____

Name_____ Title_____

Street_____

City_____ Zone____ State_____

For more data circle 362 on Reader Service Card

Photo courtesy Bayron Coating Corp., Paterson, N. J.

Which plastisol is hooked to savings?

Unichrome Coating 218X, of course!

NOBODY ARGUES that use of a protective vinyl plastisol coating on racks, screens, even anode hooks can cut maintenance costs. Economy-wise platers who know plastisols through long experience are also in agreement on *which* to use. Some have been using Unichrome Coating 218X for 10 years overall. Some have seen it survive 6 years in daily use! They've found that *using the best quality at the outset saves money in the long run.*

Non-contaminating Coating 218X withstands harshest plating and cleaning cycles, even those with vapor degreasing cycles. It won't chip, tear, blister. An experienced firm nearby can apply it for you, if you prefer . . . ask us for names.

First name in plastisols for all plating purposes . . .

UNICHROME

METAL & THERMIT
CORPORATION
General Offices: Rahway, New Jersey
Atlanta, Pittsburgh, Detroit, E. Chicago, Los Angeles
In Canada: Metal & Thermit-United Chromium of Canada, Limited, Rexdale, Ont.

For more data circle **363** on Reader Service Card

known as standard or large "PG" wheels—will continue to use changeable aluminum flanges.

Three adapter kits designed for use with the disposable-flange-type "PG" wheels make it possible to fit the wheels onto any portable tool or bench lathe.

Further information about the small "PG" wheel line is available from Minnesota Mining & Manufacturing Co., Dept. F7-268, 900 Bush St., St. Paul 6, Minn.

For more data circle 2 on Reader Service Card

★ ★ ★

High-Vacuum Trap

A laboratory model ultra-high-vacuum component for isolating a vacuum system from contaminating oil vapor and impurities is available from the Rochester Division of Consolidated Electrodynamics Corporation, 1775 Mt. Read Blvd., Rochester 3, N. Y.

Known as the Copper-Foil Trap, Type TFG-51, this unit reduces back-streaming, which limits the ultimate pressure attainable with oil-difussion pumps. There is little difference in ultimate pressure when this trap is cooled by a liquid refrigerant or remains at room temperature.

With the copper-foil trap isolating the vacuum chamber from oil vapors, it is possible to reach pressures as low as 10^{-13} mm Hg in a glass system by using an ionization gage as a pump. The TFG-51 has been found effective

THERE IS NO WISDOM LIKE FRANKNESS!
ALKALI IKE
. . . and any metal working Superintendent will recognize the wisdom in investigating the chemical industries' new developments.
Worthy of your time and investigation is—
APEX "761" Cleaning Compound
Moderately alkaline, free rinsing soak cleaner, coupled with powerful emulsifiers for quick removal of impacted drawing and polishing compounds from ferrous and non-ferrous metals.
Your Inquiry Will Be Appreciated
Apex ALKALI PRODUCTS CO.
A complete line of Cleaning Compounds for the Metal Finishing Industry
Main and Rector Streets • Philadelphia 27, Pa. • IV 3-3939
SYRACUSE BOSTON DETROIT ATLANTA PITTSBURGH WEST HARTFORD

For more data circle 364 on Reader Service Card

"PROOF of THE FINISH is in THE OVEN" ...to a great extent.

We're inclined to base this statement on the testimonies of the many manufacturers we have been privileged to serve.

High volume, high quality finish production is almost a necessity everywhere today.

Users of our oven designs and installations tell us they are accomplishing this with comparatively low operating costs.

This makes for satisfaction all around.

Typical Quotes from Many of the Satisfied Users of LANLY Ovens in Diversified Industries

"Our paint appearance and gloss has improved considerably since we installed the New *LANLY BAKE OVEN.*"

R. O. R.

"We bake twenty-two colors in pastel shades on metal. With the LANLY OVEN we have experienced highly satisfactory results in obtaining uniform color and complete baking."

K. W. B.

We'll welcome the opportunity to discuss your drying and baking operations with you without obligation.

WRITE FOR THE CATALOG . . .

LANLY
FINISHING OVENS
THE LANLY COMPANY • 760 PROSPECT AVE
CLEVELAND, OHIO

For more data circle **365** on Reader Service Card

for over a month of continuous normal operation before requiring a high-temperature bake-out to clear the foil of adsorbed gases.

For further information write for Bulletin 10-1 to Consolidated Electrodynamics Corp., Rochester Div., 1775 Mt. Read Blvd., Rochester 3, N. Y.

For more data circle 3 on Reader Service Card

Electroless Gold Plating Process

Discovery of a dipping process which imparts a gold finish to many metals has been announced by Baker & Co., Inc., one of the Engelhard Industries.

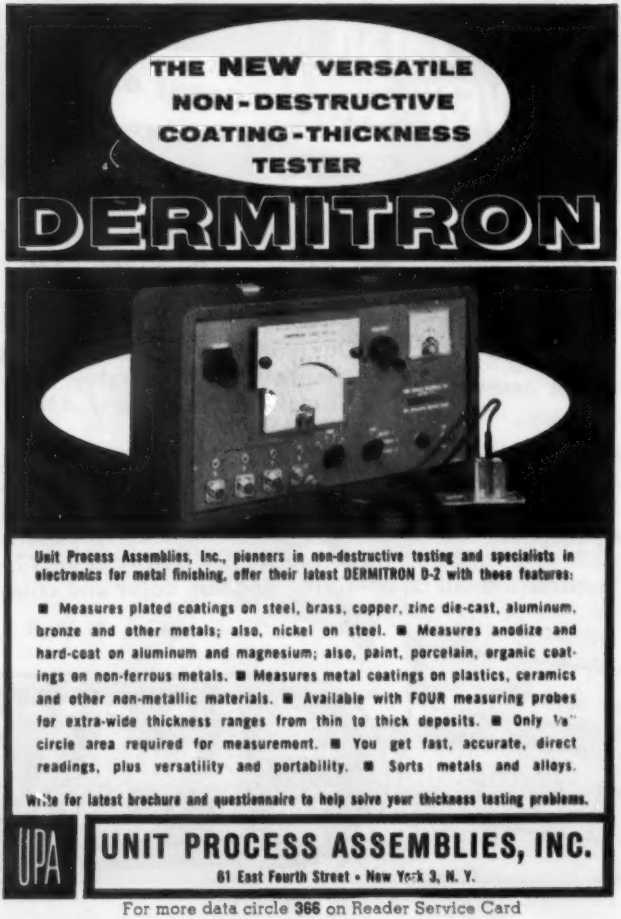
Called "Atomex," the process requires no current. Objects to be coated are simply immersed in a bath containing gold and other ingredients.

Applications include trophies, costume jewelry, printed electrical circuits, auto trim, lamp components, clock assemblies, photograph frames, perfume and whiskey bottle caps, radio knobs, metalized plastics, and electrical plug connectors.

Dr. E. F. Rosenblatt, vice president and director of research at Baker, said Atomex works by ionic displacement. "Attacked chemically, the base-metal surface sheds atoms into the bath. These are replaced by atoms of gold from the bath," he explained.

On the basis of tests by manufacturers of trophies and jewelry, the process has five advantages, Baker states:

1. The coating is dense.


THE NEW VERSATILE
NON-DESTRUCTIVE
COATING-THICKNESS
TESTER
DERMITRON
Unit Process Assemblies, Inc., pioneers in non-destructive testing and specialists in electronics for metal finishing, offer their latest DERMITRON D-2 with these features:
■ Measures plated coatings on steel, brass, copper, zinc die-cast, aluminum, bronze and other metals; also, nickel on steel. ■ Measures anodize and hard-coat on aluminum and magnesium; also, paint, porcelain, organic coatings on non-ferrous metals. ■ Measures metal coatings on plastics, ceramics and other non-metallic materials. ■ Available with FOUR measuring probes for extra-wide thickness ranges from thin to thick deposits. ■ Only ⅛" circle area required for measurement. ■ You get fast, accurate, direct readings, plus versatility and portability. ■ Sorts metals and alloys.
Write for latest brochure and questionnaire to help solve your thickness testing problems.
UPA
UNIT PROCESS ASSEMBLIES, INC.
61 East Fourth Street • New York 3, N. Y.
For more data circle 366 on Reader Service Card

NEW GOLDEN BONDERITE for Aluminum

Uniform color means uniform coatings and uniform efficiency

It's the simplest thing in the world to check on the efficiency of a Golden Bonderite installation. Just look at the color of the aluminum as it comes out of the Bonderite machine. The uniform golden coating looks the same—and it is the same—24 hours a day, seven days a week.

Golden Bonderite sets entirely new standards of efficiency and performance as a paint base for aluminum and its alloys. Operated with the Parker "Reactifier," the Golden Bonderite solution can be used indefinitely, ending the costly necessity of dumping the bath at frequent intervals. Normal chemical replenishment keeps the Golden Bonderite solution in continuous balance.

This ease and certainty of achieving uniformly excellent results means real savings for aluminum fabricators.

It guarantees an effective base for paint.

It breaks the finishing line production bottleneck.

It saves money on chemicals.

It saves money on rejected parts and minimizes field calls because of finish failures.

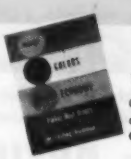
There are no limitations on the use of new Golden Bonderite. It may be applied by spray or immersion. Treatment cycles can be set to suit production speed and equipment.

Samples of Golden Bonderite-treated aluminum, plus test data, are available for your inspection. Write or call.

How Parker "Reactifier" Works

In conventional surface treatments of aluminum, work passing through the solution causes a buildup of impurities. As impurities increase, solution efficiency decreases until there's nothing to do but dump the bath and start over.

The Parker "Reactifier" removes these impurities as fast as they are formed in the Golden Bonderite solution. Constant circulation of the Golden Bonderite through the exclusive "Reactifier" means a balanced, efficient solution that can be used indefinitely.



Write for Bulletin in COLOR!

Get your copy of the descriptive bulletin on Golden Bonderite and its companion, Green Bonderite, for aluminum. It's new!

Since 1914—leader in the field

PARKER RUST PROOF COMPANY
2172 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE	BONDERITE and BONDERLUBE	PARCO COMPOUND	PARCO LUBRITE	TROPICAL
corrosion resistant paint base	aids in cold forming of metals	rust resistant	wear resistant for friction surfaces	heavy duty maintenance paints since 1883

**Bonderite, Bonderlube, Parco, Parco Lubrite, Parker Pre-Namel—Reg. U.S. Pat. Off.*

For more data circle **367** on Reader Service Card

2. All parts of the object, even blind recesses and the inside of tubing, receive a uniform deposit.

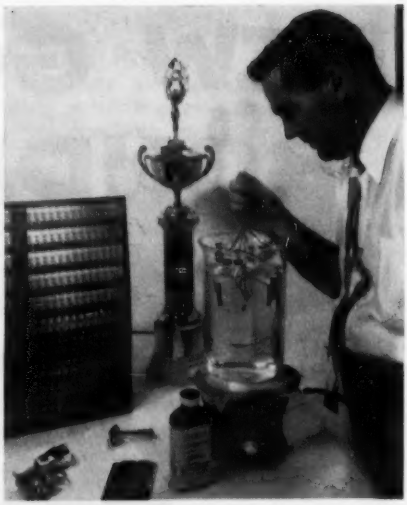
3. The gold interlocks with the base metal, providing a firm bond.

4. Little analytical control of the bath is necessary. In the case of copper, pH must be controlled.

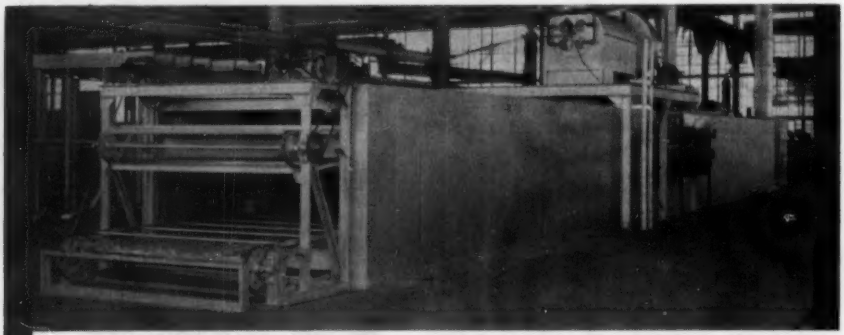
5. All the gold in the bath can be consumed. The spent solution is thrown away.

The process has been tested successfully on copper and copper-base alloys, cadmium, zinc, nickel, iron, Wood's metal, nickel-silver 12 per cent, type metal, steel, die-cast alloys, soft solder, pewter, Alumel, cobalt, and bismuth alloys. It undoubtedly can be used on a number of other alloys not tested, according to Baker.

Coatings up to 10 millionths of an



Cuff links and tie pins are coated with gold in a demonstration of a process which imparts a 24-carat coating. The process requires only a container and a heat source.



▲ *A continuous Double Strand paint drying oven with gas fired, recirculating air heater.*

carl mayer DRYING OVENS

• Guaranteed Uniform Temperature
• Long, Trouble-free Service

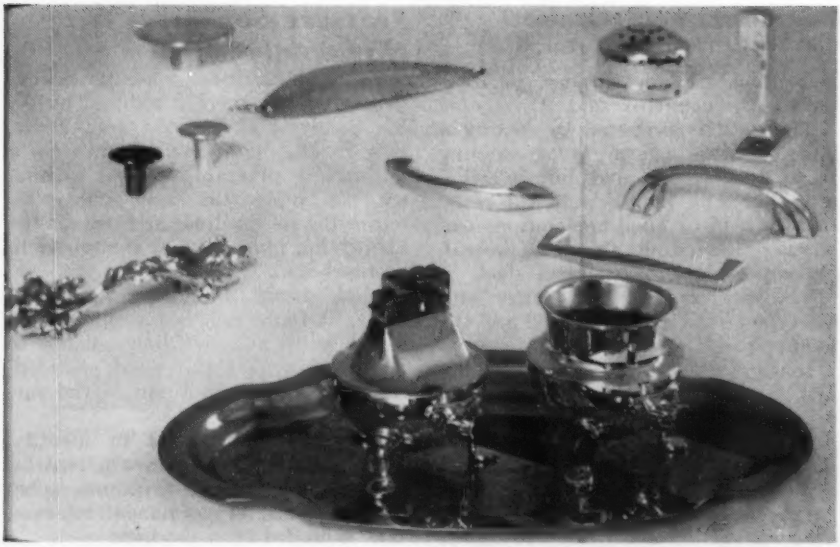
THE CARL MAYER CORP.

3030 EUCLID AVENUE • CLEVELAND 15, OHIO

A Few of Our Customers . . .

American Radiator Co.
Bendix Aviation Co.
Ford Motor Co.
General Electric Co.
General Motors Corp.
Glidden Co.
Mullins Mfg. Co.
North Electric & Mfg. Co.
Rheem Mfg. Co.
Westinghouse Electric Co.

For more data circle 368 on Reader Service Card



Plated under vacuum, these articles have a high-sheen surface that lasts as long as conventionally plated pieces.

Why plating with **vacuum** *is easier and more profitable*

Without buffing, polishing, cleaning baths, or highly skilled help, you can now plate articles with a shimmering finish that lasts indefinitely.

Vacuum-plating costs less. With a CEC vacuum coater and unskilled labor you can plate thousands of pieces per day—to look like gold, silver, copper, or a multitude of other colors and tones.

New longer-lasting lacquers make many vacuum-plated articles wear as well as those plated conventionally. The stayfast finish requires no retouching, or buffing, or polishing—just an easily applied coat of lacquer.

Write for information on CEC coaters.

Consolidated Electrodynamics

Rochester Division, Rochester 3, N.Y.

formerly Consolidated Vacuum

OFFICES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

For more data circle **369** on Reader Service Card

inch thick can be applied to most metals, the company said.

The bath is prepared by mixing a 200 c.c. unit of concentrate, containing ½ oz. troy of fine gold, into a gallon of water. Any tank which will resist slightly acid or alkaline solutions can be used, including Tygon, Koroseal, polyvinyl, glass, or stainless steel.

The rate of deposition varies with the type of metal being plated and the temperature.

In general, objects to be plated are first cleaned. In the case of copper-printed circuit boards, however, it has been found that scrubbing with wet pumice or proprietary cleansing powders is better than chemical cleaning.

Further data on the process is available from Baker & Co., Inc., 113 Astor Street, Newark 2, N. J.

For more data circle 4 on Reader Service Card

Pressure-Sensitive Nameplate

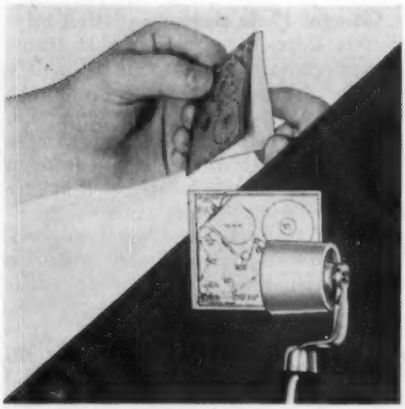
An anodized, self-bonding metal nameplate has been introduced by W. H. Brady Co. Called Quik-Plate, this metal plate is backed with a permanent pressure-sensitive adhesive. To apply, the user simply removes the release liner and presses the identifying plate against the object to be marked.

Made from 0.004 inch aluminum, the Quik-Plate is baked with a pressure-sensitive adhesive that adheres to metal, glass, plastic, wood, painted, smooth, flat, wrinkled and curved surfaces.

Quik-Plates are used to identify, instruct and inform; for trademarks, insignia, warranties, diagrams, schematics—wherever permanent information is needed on a product.

The pressure-sensitive plates are available in a wide range of colors,

The FOAMING ETCH BLUES
Quick, Joe, dump some more solution from this etching tank! It's foaming so much it's going up the stack and spraying the cars outside.
It's the high concentration of etchant and the high temperature you have to use in your tanks that causes this terrific foaming. Pennsalt Aluminum Etchant 16 will let you operate twenty degrees cooler, and you'll need only half the concentration you're using now.
But remember, Steve, we can't afford to stain or streak these extrusions.
Don't worry about tha
Ernie. AE-16® built
reputation on a fi
satin etch—and
scale in the tank
either! Let me se
you a drum tomorro



Quik-Plate Pressure-Sensitive Nameplate

both glossy and matte finish. The legend is imbedded in anodized colors that become a permanent part of the aluminum nameplate. Colors will not tarnish, peel, crack or crumble off, the manufacturer states.

For samples and literature, write W. H. Brady Co., 746 W. Glendale Ave., Milwaukee 9, Wisconsin.

For more data circle **5** on Reader Service Card

★ ★ ★

Rhodium Plating Solution

General Plate Division of Metals & Controls Corporation has introduced a rhodium plating solution.

General Plate's Rhodium Plating Solution

You know, Ernie, while Steve Choren from Pennsalt was in yesterday to adjust our phosphating cycle, he looked this over and thought he had the answer.
Let's get him here fast.
A MONTH LATER...
Well, Ernie, how did you make out with the Pennsalt etchant?
Fine, Steve! No more of that annoying foam, no more scale problem in the tanks, and we're getting a fast, clean etch with Pennsalt AE-16. Thanks for pulling me out of a tight spot.

No matter what the metal or the problem, take advantage of Pennsalt's wealth of know-how in metalworking chemistry. Call your Pennsalt salesman or send the coupon to get "A BETTER START FOR YOUR FINISH."

Pennsalt Chemicals

Pennsalt Chemicals Corp., Dept 546
3 Penn Center, Philadelphia 2, Pa.

Send information on Pennsalt
☐ metal cleaners ☐ phosphate coatings
☐ cold-working lubricants.

Name _____ Title _____

Company _____

Street Address _____

City _____ Zone ____ State _____

For more data circle **370** on Reader Service Card

Rhodium plating, which covers a base metal with an unusually hard, brilliant, platinum-colored metal finish, is useful in numerous costume jewelry and industrial applications. Among these are items requiring a decorative finish, reflectors and mirrors, electrical contacts, wave guides and printed circuits.

General Plate rhodium plating solution is shipped in unbreakable transparent containers that can be safely handled and stored. A scale on every container ensures accurate and economical measuring of the liquid content. General Plate is also equipped to refine residual solutions that are returned by electroplating firms when their solutions become contaminated. The General Plate refinery will also reclaim rhodium from plating racks and wires.

Detailed information is available from General Plate Div. of Metals & Controls Corp., Attleboro, Mass.

For more data circle 6 on Reader Service Card

★ ★ ★

Detergent

Kelite A-P-C, a concentrated powdered detergent, has been developed by Kelite Corporation.

Kelite A-P-C is buffered to maintain a maximum pH of 10.6. The cleaner exhibits excellent cleaning properties, it is stated, yet will not harm the hands. The patented detergent has high sudsing and high suds-staying power. It is safe on all commonly - found surfaces, including aluminum and durable painted surfaces,

Once tried – Always used . . .

STANTITE PRIMERS

STANTITE Wash Primer (#66R-3157A) with Thinner (#80R-342) prevents oxidation of non-ferrous metals – and corrosion creep in ferrous metals. Other advantages . . . excellent bonding qualities, extremely quick drying and easy handling. Can be topcoated with practically all types of finishes.

Try STANTITE Wash Primer or any primer in the complete STANTITE line . . . then compare with any other on the market. You'll stick with STANTITE.

WRITE FOR DATA SHEETS ON STANTITE PRIMERS . . . TODAY!

STANLEY CHEMICAL COMPANY*

Subsidiary of The Stanley Works

DEPT. J, 1468 BERLIN STREET, EAST BERLIN, CONN.

**Member, Vinyl Dispersions Division, S.P.I.*

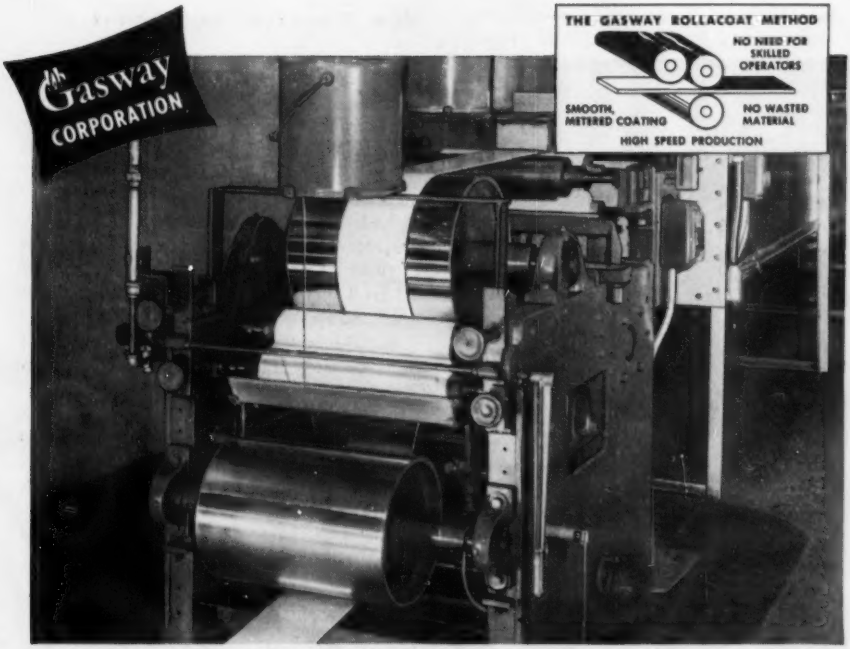
STANLEY

See Stanley first for finishes that last

LACQUERS • SYNTHETICS VINYLS • ENAMELS

STANLEY TOOLS • STANLEY HARDWARE • STANLEY ELECTRIC TOOLS

For more data circle **371** on Reader Service Card



This manufacturer produces faster... saves 67% on paint ...gets more uniform finish... with GASWAY ROLLACOATING

Here's how KoolVent Metal Awning Co. is controlling manufacturing costs and getting a better product, with its Gasway Continuous Strip Coating Line.

For example, KoolVent estimates that *paint consumption is approximately 33%* of what it was before the company installed its coating line. *850 square feet of aluminum is covered with one gallon of paint!* In addition to these savings, *KoolVent can and does coat an average of 8500 pounds of aluminum stock per 8 hour shift.* This is possible because the Gasway line produces 75 feet of enameled and baked strip per minute.

The manufacturing advantages don't stop with the painting either. KoolVent roll-forms its awning parts after coating. This is the last step in the manufacture of the parts. Assembly of the awning is the only thing left to do. The only handling done during manufacture is handling of coiled stock. The automation in finishing and forming operations increases efficiency, and also cuts costs significantly. *Get all the details today!*

INFORMATION AVAILABLE—Gasway will send you full details on rollacoating at no obligation. Whether you have tremendous production rates or intermittent manufacturing, there's a Gasway coater to handle the job. Send for the whole story.

Gasway
CORPORATION
6459 North Ravenswood Ave.
Chicago 16, Illinois

LOOK TO GASWAY FOR EFFICIENT, HIGH PRODUCTION COATING OF STRIP, SHEET OR PANELS

For more data circle 372 on Reader Service Card

Haveg Equipment Solves Corrosion Problems in Handling
ACIDS • ALKALIS • SOLVENTS • HF • FUMES

First name in Corrosion Resistant Equipment

HAVEG

HEAT EXCHANGERS
PROCESS TANKS
FUME DUCTS
PIPING
PUMPS
VALVES

For More Information See Chemical Engineering Catalog

HAVEG PLASTICS OF TOMORROW
SOLVE YOUR CORROSION PROBLEMS TODAY

HAVEG CORPORATION
914 GREENBANK ROAD
WILMINGTON 8, DELAWARE
For more data circle 373 on Reader Service Card

the manufacturer states. The product conforms to specifications for cleaning painted surfaces, including Federal Specification PC431 (cleaner for painted surfaces).

Kelite A-P-C is used in a concentration of ½ oz. to 4 oz. to a gallon of water, at a temperature range of 70 to 140 deg. F. It is soluble in hot, cold, hard, soft, or saline water.

Kelite recommends this detergent for cleaning floors, vehicles, and equipment and as a steam cleaning composition.

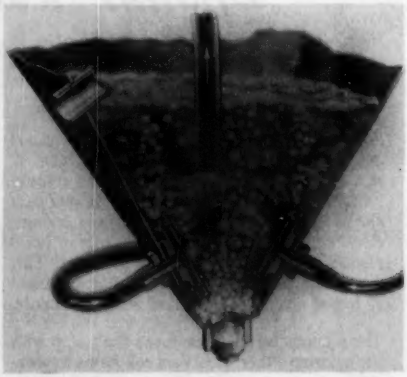
For further information, write to Kelite Corp., 81 Industrial Road, Berkeley Heights, N. J. Ask for Bulletin P-7572.

For more data circle 7 on Reader Service Card

★ ★ ★

Agitator for Wet-Blasting Abrasives

An apparatus that will keep fine abrasives used in wet-blast cleaning thoroughly slurried has been announced by Pangborn Corporation, Hagers-

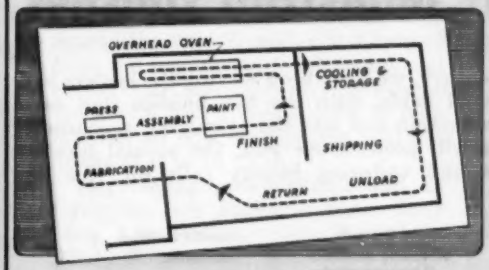


Cutaway drawing shows how Pangborn Slurrator is used to agitate wet-blasting abrasive

CHAINVEYOR

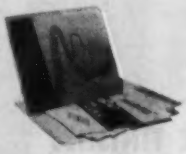
PAINT DEPT.
WE'RE RUNNING TWO SHIFTS NOW ED - BUT WE'VE GOT TO INCREASE PRODUCTION !
IT'S A PROBLEM... FRANK, LET'S CALL CHAINVEYOR AND SEE IF THEY CAN HELP US-

Chainveyor has standard *16" radius curves*, can even travel vertically up or down. This *versatility* saves floor space and can solve your most complex conveyor problems. Its *dependability* has been proved in all types of industry. Complete enclosure and heat-treated moving parts insure long life with minimum upkeep.



Before, parts were hand trucked to paint area, unloaded, painted on each side in two operations, manually stacked for drying and again loaded and trucked to shipping. **CHAINVEYOR'S solution** was a system that rapidly moves parts from assembly thru painting and baking ovens to shipping . . . *without handling.* Rotating carriers automatically turn the parts to insure even painting in less than half the time.

- **Chainveyor** *carries up to 30 pounds on 6" centers. Individual loads up to 120 pounds are supported by load bar attachments.*
- ***Low in first costs.*** *Chainveyor assists in increasing production and decreasing overall costs.*
- ***Efficiency and simplicity*** *of design does away with complicated and expensive idler and guide rails on standard curves.*
- ***Dualine systems*** *afford unlimited application in any stop and go production situation or in-process storage, combining power and free operations.*
- ***Proved dependability*** *by successful installations in all types and phases of industry.*



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Illustrated catalogue and complete details

QUALITY OVERHEAD CONVEYOR SYSTEMS

CHAINVEYOR®

CORPORATION

DISTRIBUTORS IN ALL PRINCIPAL CITIES

DISTRICT SALES OFFICES • NEWARK CHICAGO DETROIT NEW ORLEANS

MAIN OFFICE • 5618 E. Washington Blvd., Los Angeles, Calif.

For more data circle **374** on Reader Service Card

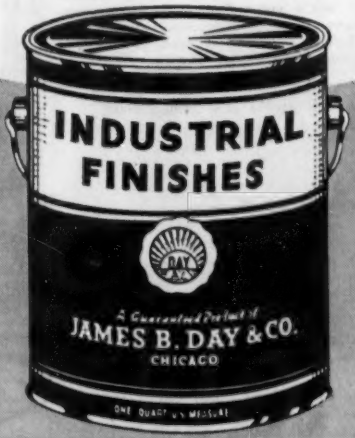
PERFORMANCE TESTED!

for Enduring Beauty

Dayco industrial finishes

For more than half a century, we have been serving the leaders in a wide variety of industrial fields, with the fine finishes that save time and money on production and add the attractive appearance that sells. We have or will produce for you, the special finishes economical production and enduring beauty calls for. We are specialists in:

- Clear and colored Lacquers
- Primers
- Surfacers
- Baking Enamels
- Screening Materials (Lacquers-vinyls-synthetics)
- Handle Finishes
- Removers
- Undercoaters
- Stains



FINE FINISHES SINCE 1906

Write us about your needs

JAMES B. DAY & COMPANY

1872 Clybourn Avenue • Chicago 14, Illinois

town, Md. Designed to prevent the solid packing of abrasive at the bottom of the tank after overnight shutdown — the Sluriator eliminates the need for a mechanical pump and auxiliary equipment and can be adapted to conical-bottom tanks.

The Sluriator consists of a 4-inch-diameter compressed air distributor set between two heavy-gage Wear-Resist alloy circular plates. Two such fittings are installed at the base of the sloping side walls of the abrasive slurry tank, so that the agitating air strongly sweeps the tank bottom as well as spirals through the body of the liquid to provide rapid and thorough agitation of the slurry.

The only equipment required to supply the new Sluriator is a take-off from the regular 80- to 90-pound compressed air line necessary to operate the nozzle, and a needle valve to regulate the air flow through the Sluriator heads at 6 to 10 c.f.m.

Engineering specifications and information are available from Pangborn Corporation, 5000 Pangborn Blvd., Hagerstown, Md.

For more data circle **8** on Reader Service Card

★ ★ ★

Multi-Color Spray Gun

A multi-color spray gun that permits applying all patterns and types of fleck materials without adding extra parts has been introduced by Sharpe Manufacturing Company, Los Angeles, Calif.

Sharpe Flock Gun

The gun is said to conserve paint and allow for faster application, even though using a two-coat system.

Designated Sharpe 35VZ"C"MC, the gun embodies main-line air

For Buffing IRREGULAR SHAPES

NEW 6" wide buff finger features CHURCHILL Finger-Buff* # 501

Here is a brand new buff that has **proven** its worth for buffing large irregular shapes without excessive wear on any part of the face. This new Churchill Finger-Buff* #501, with the 6" wide buff finger, has **proven** to run at cooler temperatures, to last longer, and to wear down uniformly!

For low cost, cutting **and** coloring stainless and die castings, especially for irregular shapes, specify this super-flexible Churchill Buff #501.

• Churchill Finger-Buffs* are made from sisal or cloth; always bias-cut and top grade material; in all sizes from 3" to 21" diameters.

*Churchill Finger-Buff, T.M. Reg. U. S. Pat. Off.

REPRESENTATIVES IN PRINCIPAL CITIES

Geo. R. Churchill Co., INC. FREE Catalog

Dept. PF, Hingham, Mass.

Please send me FREE Catalog and complete information. My special buffing problem is .....

Name ..... Title .....

Firm .....

Street .....

City ..... Zone ..... State .....

For more data circle **376** on Reader Service Card

←For more data on advertisement on opposite page circle **375** on Reader Service Card

adjustment (allowing for any type fleck pattern); a fluid nozzle that permits any desired material metering; and an internal air nozzle designed for multiple application.

The Sharpe gun is used with a one-h.p. or larger compressor and a pressure paint tank with regulating valve and gage.

Additional information on this multi-color gun is available from Sharpe Manufacturing Co., 1224 Wall St., Los Angeles 15, Calif.

For more data circle 9 on Reader Service Card

★ ★ ★

Metal Stripper

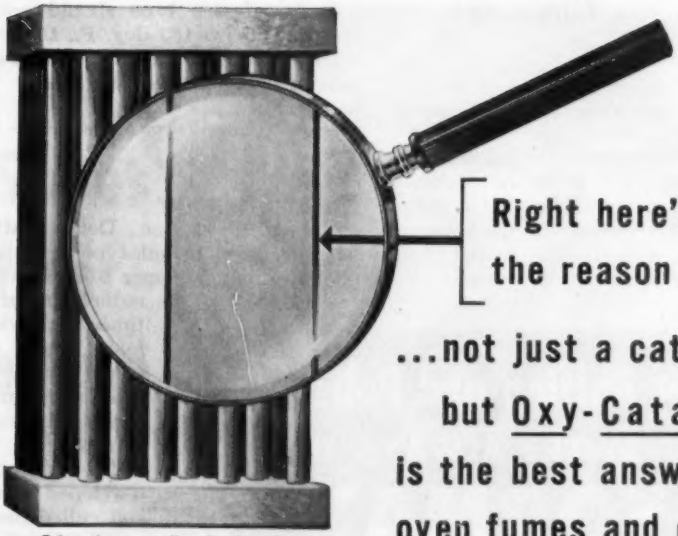
A product called Iso-Strip, recently introduced by Wagner Brothers, Inc., 400 Midland, Detroit, Michigan, is useful in stripping plated deposits without using current. The light, flaky organic compound, when combined with sodium cyanide and dissolved in water, will strip copper, nickel, cadmium, zinc, or silver from ferrous metal parts. Size of the part does not hinder effectiveness of the compound.

The company lists the following advantages for this material: it does not etch the base metal; parts may be stripped in baskets or tumbled in barrels, thus racking is eliminated; the chemical can be used cold by increasing immersion time.

To use this product, a tank, a draft box and a temperature regulator are required.

To obtain good results, the work to be stripped must be free of grease and oil, and if parts are chromium plated,

For more data circle 377 on Reader Service Card



Enlarged cross-section drawing of an individual rod in an Oxycat unit

Right here's the reason...

...not just a catalyst but Oxy-Catalyst is the best answer to oven fumes and odors

The secret lies in the .003-in. film on the porcelain Oxycat carriers. It's this more efficient catalyst which Oxy-Catalyst uses, a patented combination of alumina and platinum on porcelain, that gives better cleanup, better heat recovery, and longer catalyst life.

Oxycats can eliminate fumes and odors from drying ovens and other processes by oxidizing organic and combustible contaminants in the exhaust far more efficiently than any other catalyst ever developed.

To stop your oven fumes and odors—to recover waste heat—to reduce fire hazards and maintenance problems caused by troublesome condensates, Oxy-Catalyst offers a complete engineering service. We make the entire installation—engineered to your exact requirements—and we assume full responsibility for the performance of the equipment.

Oxy-Catalyst works closely with all leading oven manufacturers. And new ovens can be designed with the catalyst as an integral part of the oven's heating system. So when you order new ovens, specify Oxy-Catalyst equipment.

If you would like to compare—to see for yourself the remarkably high efficiency of an Oxy-Catalyst installation—fill in this coupon, or write on your business letterhead, for complete information now.

Oxycat units were installed at the end of this vertical drying oven to oxidize troublesome solvent and varnish fumes at John A. Roebling's Sons Corporation, Electrical Wire Division Plant. This installation has been operating now for over 4 years.

OXYCAT

OXY-CATALYST, INC.

Industrial Division, Wayne, Pa., U.S.A.

Fume Elimination Processes and Equipment
Industrial • Automotive • Consumer Products

Oxy-Catalyst, Inc., Industrial Division, Wayne 13, Pa.
Please send me complete information on your catalytic installations:

☐ For fume and odor elimination ☐ For waste heat recovery ☐ Have your representative call

Name_____

Firm Name_____

Street_____

City_____ Zone No._____ State_____

For more data circle **378** on Reader Service Card

the chrome must be removed by immersion in muriatic acid or caustic soda with reverse current.

In stripping nickel at a temperature of 140 deg. F., Iso-Strip removes 0.0005 inch of metal in 20 minutes. Other nonferrous metals are stripped at the rate of 0.001 inch in the same time, under identical conditions.

Baths of this type should not be operated above 150 deg. F., the manufacturer states, since the sodium cyanide decomposes rapidly above this temperature.

For more data circle **10** on Reader Service Card

★ ★ ★

Paint Stripper

Wagner Bros., Inc., Detroit, Mich., has introduced a tank-type accelerated alkaline paint stripper that is said to reduce immersion times and do a faster, more efficient job of removing almost any paint, lacquer or enamel.

The recently developed material, called Benchmark F-195, is said to contain ingredients that destroy the paint bond, and wetting and penetrating agents that aid subsequent cleaning operations. Rinsing operations are also simplified, the manufacturer reports, since adhering pigments that remain on the surface after the bonding resin is completely removed are easily washed away.

Although the stripper is effective at temperatures of 180 deg. F. to boiling, it acts faster in a boiling solution. A

To page 126→

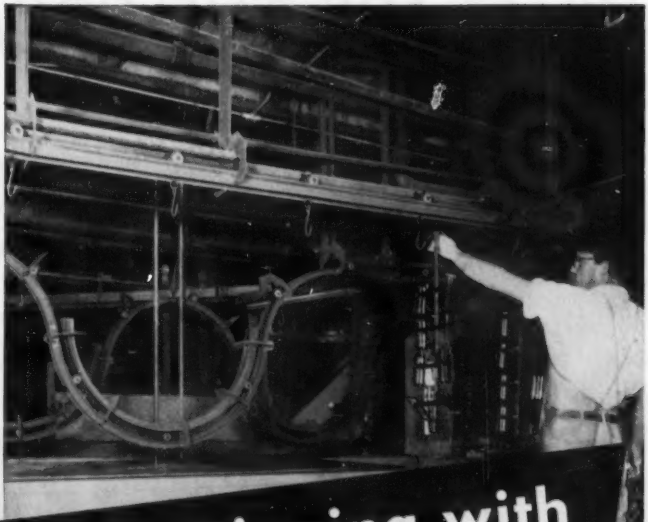
Formax manufactures a complete line of Buffing and Polishing Compounds in bar, tube and liquid form suitable for all classes of metal, plastic and lacquer finishes. Formax compounds used together with the famous Formax ZIPPO long wearing buffing wheels make a combination that's hard to beat. Our extensive manufacturing, laboratory and testing facilities are always at your disposal.

Descriptive Catalogs Available on Request.

FORMAX MFG. CORP.
DETROIT 7, MICHIGAN
"THE FOUR McALEERS"

For more data circle **379** on Reader Service Card

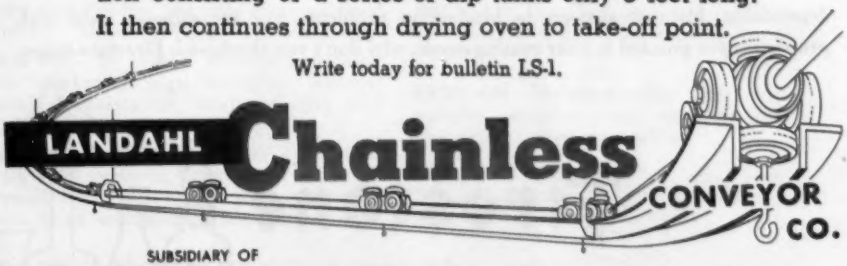
Saves floor space!



Multiple Dipping with LANDAHL CONVEYOR

Sharp dips and turns are features of this installation. The Landahl Chainless conveyor furnishes both horizontal and vertical turns on a minimum radius of 24 inches. The conveyor carries metal products through a cleaning operation consisting of a series of dip tanks only 6 feet long. It then continues through drying oven to take-off point.

Write today for bulletin LS-1.



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THE AMERICAN MONORAIL CO.

13142 Athens Avenue • Cleveland 7, Ohio

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WHAT ARE THE PROPERTIES

Now you get specific answers to special coating problems with pin-pointed properties of Firestone Exon's 6 solution resins

Protective coatings take many forms to fill many needs. Putting the specific answers to these needs into your coatings creates manufacturing problems. That's why Firestone gives you 6 Exon solution resins, each pin-pointed to specific solution problems.

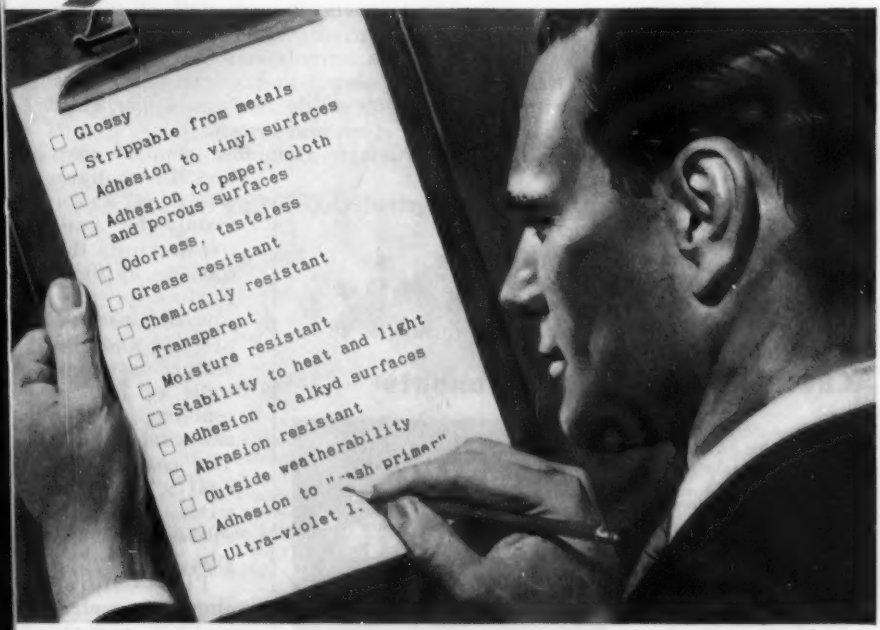
For instance, each Exon resin is engineered so that its solubility and adhesion factors fit particular types of applications. All Exon resins give you greater resistance to chemicals, abrasion, corrosion and weather. All dissolve quickly in appropriate solvents.

No wonder more manufacturers of solution coatings turn to Firestone for resins with dependable, low-cost answers to production problems. For the solution resin with properties pin-pointed to your coating needs, why don't you check with Firestone today.

Firestone

Industry's most complete line of vinyls engineered to your specific needs

YOU WANT IN A RESIN?



Here Are 6 Solution Resins Engineered for Successful Coatings

EXON 450 For low cost strip coatings. Good solubility, tensile strength and durability.

EXON 461 A unique fluorine-containing resin combining high solubility, unusual chemical resistance, heat stability and weatherability.

EXON 470 Excellent adhesion to metals, alkyd, vinyl surfaces. Compatible with wide range of drying oils, alkyds, phenolics, melamines. High solubility in low-cost solvents.

EXON 471 Excellent for weatherability and durability in a protective coating. Corrosion resistant.

EXON 481 Makes possible high strength, colorful, abrasion-proof, washable coatings that resist fading or cracking.

EXON 485 For superior strip coatings. Lower viscosity makes application easier and shelf-life better. Good clarity.

For complete information and technical service, call or write:

CHEMICAL SALES DIVISION: FIRESTONE PLASTICS COMPANY

DEPT. 744M, POTTSTOWN, PA. • A DIVISION OF THE FIRESTONE TIRE & RUBBER CO.

IN CANADA, CONTACT CHEMICAL SALES DIVISION, FIRESTONE TIRE AND RUBBER CO. OF CANADA LTD., HAMILTON, ONT.

For more data circle **382** on Reader Service Card

concentration of 8 to 16 oz./gal. is necessary to provide effective action. The solution should be agitated for best results.

For more data circle 11 on Reader Service Card

★ ★ ★

Colored Aluminum Paints

Aluminum Company of America has announced the development of formulations for a complete line of colored aluminum paints and aluminum asphalt roof coatings.

This development makes possible metallic protective finishes that will waterproof, insuiate, decorate and preserve practically any type of roof or metal surface, Alcoa states.

These formulations are based on a special aluminum pigment. Colors now ready for production are copper, gold, blue, green and brown.

Although aluminum asphalt coatings have been widely used, mainly for roof protection, this colored asphalt product is also suitable for waterproofing and decorating vertical walls of cement, concrete, stucco and cinder block. The coatings are easily applied with a brush, squeegee or spray gun.

The colored aluminum asphalt coatings remain elastic, reflective and resistant to chemical attacks in industrial areas, the manufacturer states.

For the decoration and protection of tanks, structural steel and metal buildings, the formulations include a line of alkyd-based colored aluminum paints.

Additional information may be

Buschman

BUSH-LOCK

Cable Conveyor Components

Mechanized treating and finishing in just 27 ft. by 5 ft. of floor space —another space saving application of a versatile Bush-Lock Cable Conveyor, the low-cost package of standard stock components.

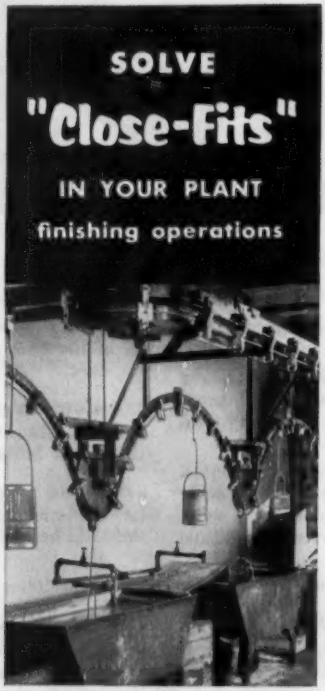
Sharp turns (from 7½" R)—plus the shortest possible dip in the industry for trolley type conveyors—eliminate space-waste and increase plant capacity in every type of industry.

Buschman specialists will cooperate with finishing equipment manufacturers making a survey of your plant requirements.

C-339-EWB

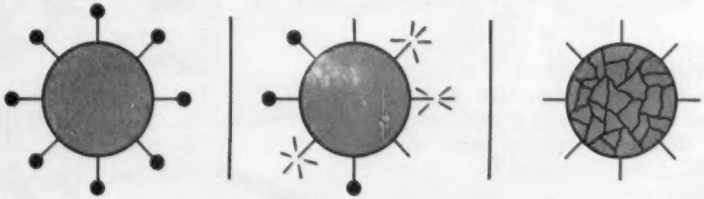
PRODUCE MORE FOR LESS with Buschman CONVEYORS

THE E. W. BUSCHMAN CO.
4516 Clifton Ave.
Cincinnati 32, Ohio

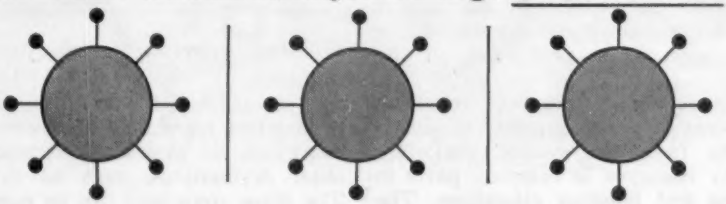


For more data circle 383 on Reader Service Card

Does the solvent you use go "sour," like this?



Use Nialk® TRICHLORethylene and get psp... like this



1. Stabilizers (small circles) protect your trichlorethylene against heat, light, air, moisture, acids, and such active metals as aluminum. At this stage NIALK stabilizer looks the same as the ordinary brand—but NIALK has psp.

2. Ordinary stabilizers wear out during use, leave solvent unprotected NIALK stabilizer never wears out. Even after repeated distillations and reuse, it's there working. So you never have to titrate or add new stabilizer.

3. When all stabilizer is gone, bath "sours," making a cleanout necessary. Bath may even stain metal parts. Avoid such damage and minimize downtime by using NIALK TRICHLORethylene with psp—permanent STAYING power.

Why you pay less to degrease with Nialk® TRICHLORethylene

You can cut the number of cleanouts of your degreaser when you use NIALK TRICHLORethylene. And you can degrease more parts between cleanouts.

NIALK has a unique stabilizer with **psp**—permanent STAYING power. It's neutral, non-alkaline, non-salt-forming. You never need replenish it.

This NIALK stabilizer actively retards the formation of degradation products —so you can clean your bath easier, faster.

Get proof of NIALK's *cheaper, safer degreasing*—Write on your business letterhead for a resumé of tests made on five leading brands.

HOOKER ELECTROCHEMICAL COMPANY
1410 UNION STREET, NIAGARA FALLS, N. Y.

HOOKER CHEMICALS PLASTICS

NIAGARA FALLS • TACOMA • MONTAGUE, MICH. • NEW YORK • CHICAGO • LOS ANGELES

Manufacturers of VIRGO® DESCALING SALT, VIRGO ELECTROLYTIC SALT, VIRGO MOLTEN CLEANER

For more data circle **384** on Reader Service Card

obtained by writing No. 721 Alcoa Bldg., Pittsburgh 19, Pa.
For more data circle 12 on Reader Service Card

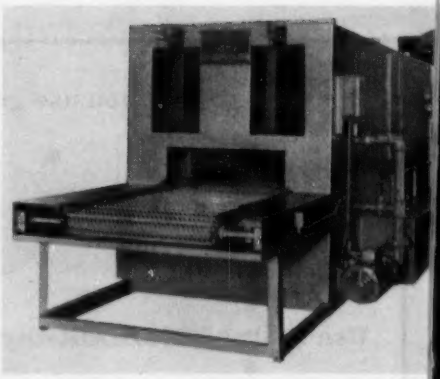
★ ★ ★

Washing Machine

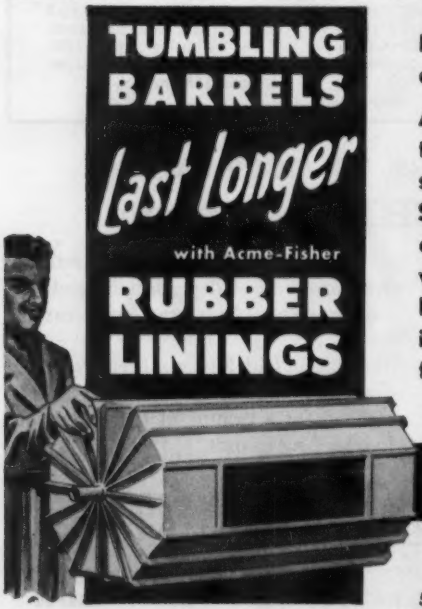
An automatic washer that has two overhead conveyors and a belt conveyor in a single housing has been introduced by Alvey-Ferguson Co., Cincinnati, Ohio.

Parts are placed on one of the three conveyors, as required by the type of part being cleaned and the subsequent operations to be performed on the part.

For example, while one overhead conveyor is carrying parts to subassembly from the washer, the other trolley conveyor is carrying parts to drying and painting operations. The flat wire mesh conveyor handles parts such as machined parts, that cannot be handled conveniently on overhead conveyors, as well as parts going to other destinations, such as storage. The three conveyors can be operated simultaneously or individually.



Alvey-Ferguson Washer has three conveyors



Deburring and finishing are rough on ordinary tumbling barrels.

Acme-Fisher Rubber Linings for tumbling barrels are tough, abrasive and chemical resistant. Specially formulated rubber linings are bonded securely to the inner walls, then cured, to form tough linings that will provide long service for the roughest deburring and finishing operation.

48 HOUR SERVICE
DIRECT FROM MANUFACTURER TO YOU

Acme-Fisher Division
BROADWAY RUBBER CORP.
529 E. Broadway Louisville 2, Ky.

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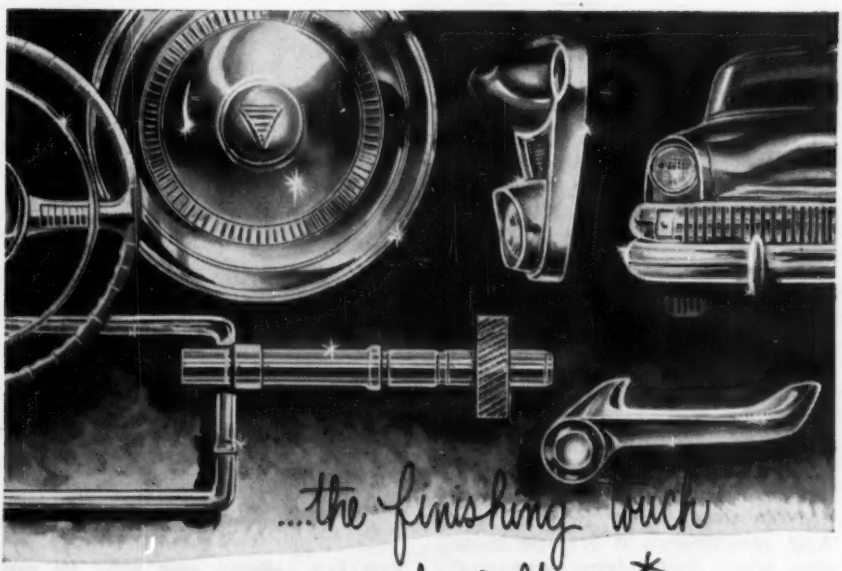
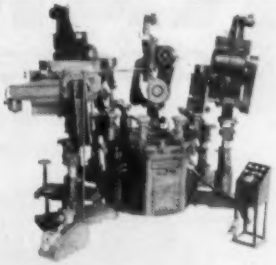


Are finishing methods a "trouble spot" in your operations? More and more cost conscious production men are turning to high-speed automatic polishing and buffing machines. You get faster, low cost polishing, buffing, deburring and more uniform results on a PACKER-MATIC, and you can also have the extra advantage of automatic loading and unloading. Long production runs, short odd-lot jobs, or a mixture of both can easily be handled. Send blueprints or sample parts and let Packer engineers show you how to speed up production and cut costs with PACKER-MATIC.



*The finishing touch on automotive parts and accessories is just one of many successful PACKER-MATIC applications.

PACKER-MATIC

THE PACKER MACHINE COMPANY • MERIDEN, CONN.

Pioneer Manufacturers of Automatic Polishing and Buffing Machines

For more data circle 386 on Reader Service Card

Common headers, solution tanks, spray systems and water lines serve all three conveyors.

Further data is available from Alvey Ferguson Co., 1978 Disney St., Cincinnati 9, Ohio.

For more data circle **13** on Reader Service Card

★ ★ ★

Dust Collector

A dust collector with a large storage capacity, Dustkop Model 520-D, has been introduced by Aget Manufacturing Company, Adrian, Mich.

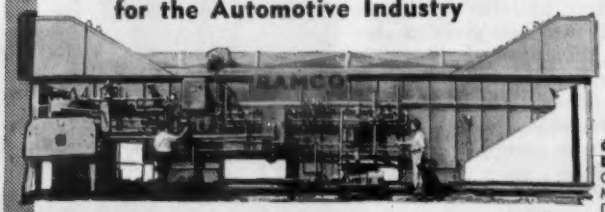
Ten inches higher than the company's standard model 520, it has identical air handling characteristics and base dimensions, but a dust storage bin that is over twice as large. Aget recommends it for use in any shop where dust volume is unusually

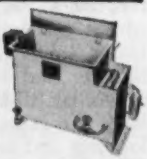
Aget Dust Collector: more space for dust

RAMCO degreasers

from Laboratory Units to Giants for the Automotive Industry

ANOTHER RAMCO PRODUCT





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GIANT FORD DEGREASER
Courtesy Ford Motor Car Co., Detroit

Call on our engineering department for the latest in ULTRA-SONIC CLEANING.

Send for FREE CATALOG. Call your nearest Ramco engineer and have your metal cleaning equipment SERVICED AT NO CHARGE.

RAMCO EQUIPMENT CORP. Div. of Randall Mfg. Co., Inc.
811 Edgewater Rd., New York 59, N. Y. • DAyton 3-3900

For more data circle **387** on Reader Service Card

"NRC VACUUM COATERS INCREASE PRODUCTION UP TO 50%"

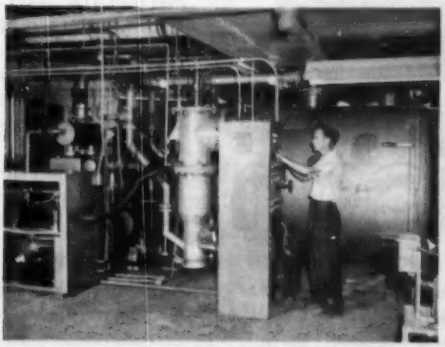
. . . says Jack Selsemeyer
Production Manager, Kent Plastics
Evansville, Indiana

"The improvements in the NRC Vacuum Coaters have helped increase production up to 50% and have reduced rejects materially. Our problems with high humidity have practically been eliminated.

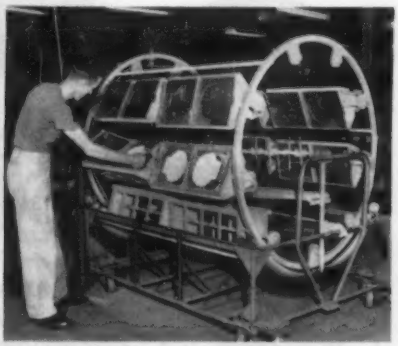
"In dry weather we can complete a cycle in about 15 minutes and in humid weather about 20 minutes. This is about half the time that it took before the latest NRC Equipment was installed.

"In addition, we are getting brighter shots and fewer items are scrapped. Also, with the 5½' x 5' plating chambers, greater capacity is realized. The planetary jigs take better advantage of the space in the plating machine. Three times as many items can be plated as in our old equipment."

You too can avail yourself of the advanced knowledge and experience of NRC Equipment Corp. in the field of high vacuum coating. Write today for information about how we might be able to help you cut your finishing costs and improve quality.



"Fewer pieces have been scrapped and production increased with NRC Equipment. This firm has been a real help to us through their highly specialized knowledge in this field" — Jack Selsemeyer.



Planetary jigs make best use of space. The arrangement permits three times more pieces to be handled per load than in former equipment.

NRC
EQUIPMENT
CORPORATION

NRC EQUIPMENT CORPORATION
Dept. 23-K, 160 Charlemont St., Newton 61, Mass.
Please send me your latest data file on vacuum coaters.
☐ We are interested in coating .....
.....
☐ Please have a representative call.
Name ..... *Position* .....
Company .....
Address .....

For more data circle **388** on Reader Service Card

large. Where the dust volume is normal, the increased capacity of the 520-D will cut the need for emptying in half.

For more data circle 14 on Reader Service Card

★ ★ ★

Plating Racks

A series of plating racks recently introduced by the Plating Equipment Division of Automotive Rubber Company, Inc., Detroit, Michigan, are reported to reduce metal build-up on racks, drag-out losses, and drag-in of solution contamination.

The design of the units provides direct current conduction from the hook to the piece-holding member without resistance joints. All rubber-to-rubber joints of the assembled rack are sealed with two ribs, one concentric to the other.

The splines and other components of this unit are completely covered prior to assembly with a newly developed, molded thermosetting compound. These splines and components incorporate self-sealing joints, and they are assembled to form a rack to meet the users' requirements.

Holding members, designed for the pieces being plated, are fabricated from spring rod or flat stock to allow the use of removable contact tips. The spring member is positively located with a stud and can be readily replaced, if necessary.

Holding members are completely protected with a molded coating

ONLY SICON "takes" the 550° F. temperature reached in sections of this Preway heater grille.

ONLY SICON protects this "Direction Flo-Grille" where temperatures often reach above 500° F.

EVEN A HOT 550° F. can't faze the finish when it's

Sicon®

SILICONE

HEAT RESISTANT FINISH

The upper grille of the famous PREWAY heater often reaches a surface temperature of 550°F. Here, the use of an organic finish was found to require raising grille to protect lower part. But in tests SICON protected so well that re-design proved unnecessary. SICON in smart decorative colors can protect your product too—and save money besides! Write for proof.

Write for copy of SICON Brochure.

MIDLAND Industrial Finishes Co.

DEPT. J-6, WAUKEGAN, ILLINOIS

ENAMELS SYNTHETICS LACQUERS VARNISHES

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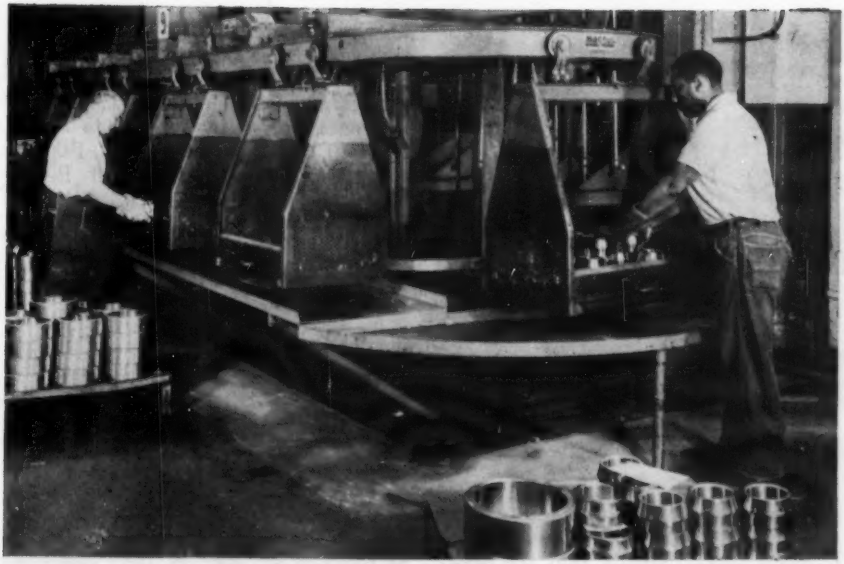

High Speed Production Lines Demand...

SAVINGS WITH FULLY-AUTOMATIC, AGITATING DIP-CLEANING METHODS!

Modern, automatic, high-speed production lines demand modern automatic cleaning machines . . . and Magnus makes them.

The Magnus Aja-Lif Automatic Cleaning Machine shown above, with Magnus #71 buffing compound remover, is used by a major bearing manufacturer to remove grinding grease from bearing races. Parts are automatically agitated in each of the stages of pre-wash, wash, rinse and anti-rust, and automatically transferred from one stage to the next on a pre-set time schedule.

The result . . . ? Thousands of dollars per year saved, without the hazards of solvent cleaning. And you, too, can realize the same savings and safety. For full information, simply write Magnus, 208 South Avenue, Garwood, New Jersey.

magnus

Industrial Cleaning Division

MAGNUS CHEMICAL CO., INC.

a world-wide organization specializing in cleaning and protection of all surfaces.

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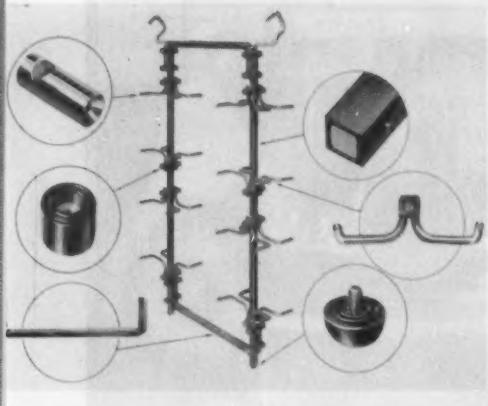

Photo shows Components of Arco Plating Rack

except for the contact tips and two circular faces on the body. One of these exposed faces extends into the spot-faced area of the spline for electrical contact. The other face is that surface to which a retainer nut of the stud is tightened. This nut is covered with a rubber-ribbed sealer cap.

Further details and specifications can be obtained by writing to Automotive Rubber Company, Inc., Plating Equipment Division, 12550 Beech Road, Detroit 39, Michigan.

For more data circle **15** on Reader Service Card

★ ★ ★

Conveyor Switch

A 3-way switch for automatic sorting of packages according to size, weight or classification has been introduced by the E. W. Buschman Company, Cincinnati, Ohio.

It provides a quick means of dispatching packages into side aisles, to the right and to the left or straight through, without the use of deflectors.

The 3-way switch may be controlled by remote push buttons, limit switches, photoelectric cells and other electrical means. Limit switches automatically

Sethco Filters Fast

FROM START SELF PRIMING instant filtration

TO FINISH Automatic Backwash Reversal Switch

LSIN-20V

Models equipped with corrosive resistant alloys and materials for every electroplating and industrial solution from pH 0 to pH 14. Removes particles down to one micron in size.

Sethco Mfg. Co.

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CHEMICAL COMPANY INC.

Canton, Connecticut

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Why do thousands use
HOT SPRAY?
WHY
HOT SPRAY
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MANUFACTURING CORP.
FREE!
This fact-packed booklet explains why thousands have switched to Spee-Flo Hot Spray for virtually every type of commercial finish and protective coating. The reason is simple:
NO MATTER WHAT YOU SPRAY, IT GOES ON FASTER, LOOKS BETTER AND LASTS 2-3 TIMES LONGER WITH HOT SPRAY—AND YOU ENJOY SAVINGS OF TIME AND MATERIALS RANGING FROM 25-50 PER-CENT!
Thousands of finishing departments have proved the advantages of hot spray to their own satisfaction and profit. You can benefit by their years of experience in every type of finishing. Write for free booklet today.
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THE SPEE-FLO CORP., Dept. PF32, 720 Polk Ave., Houston, Texas
6842

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classify by package heights. Scale controls can be used to divert underweight and overweight packages to the right and to the left, while those that measure correctly pass straight ahead.

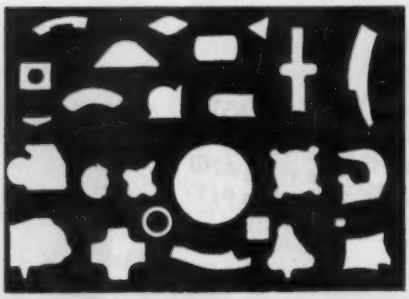
A series of classifications can be made through these switches to bring like packages into the proper storage line. Automatic diversion to a bypass line can be made in case the main conveyor line is blocked. The complete loading of one storage line can automatically switch to load a second and third line. Separation for routing to different areas can be accomplished.

The three-way switches can also be used to feed tributary lines into a common main line with the switch bringing in a new line when cartons from one line have been cleared. In this case, electrically operated stops work simultaneously with the switch.

Buschman Conveyor Switch: automatic sorting

For complete details, write The E. W. Buschman Company, 4516 Clifton Ave., Cincinnati 32, Ohio.

For more data circle **16** on Reader Service Card



Pre-Cut Masks Speed Finishing

Brady Pre-Cut Masks are self-sticking — go on fast and accurately. Protect from finishing to inspection. Hundreds of shapes and sizes in stock, for paint spraying, baking, tumbling, etc. Specials made to order. Fast delivery. Distributors in 150 cities.

Write for free samples and Bulletin 160-C.

W. H. Brady Co.

746 W. Glendale Ave., Milwaukee 9, Wis.

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FUNCTIONAL FINISHES!!

If you require your coatings to accomplish some specific task — something beyond mere ornamental appearance or average longevity—

Try Us!

We make ACRYLIC, ALKYD, CELLULOSIC and VINYLOID coatings for a very wide range of specialized industrial applications.

The Varnish Products Co.

5204 Harvard Avenue

Cleveland, Ohio

For more data circle **395** on Reader Service Card

Nickel nursing made *Easy*

Want to save nickel—or other scarce, costly anode metals?

One of the easiest ways is to cut down on rejects due to poor adhesion and blistering, by keeping your plating bath clean with Red Label DARCO® activated carbon.

Red Label DARCO is the only carbon made exclusively for the plating industry. It's the choice of custom platers and plating departments everywhere. It's made by people who know by long experience the specific problems of electroplating baths.

Red Label DARCO keeps your bath clean economically, because it has high impurity-removing power. It keeps your shop clean, too—wets quickly, gives no dusting problem. Order your supply now, from your nearby DARCO distributor. He can give you prompt delivery, in handy 50-lb. cartons.

DARCO IS MADE BY

ATLAS CHEMICALS DIVISION
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
In Canada: Atlas Powder Company, Canada, Ltd.
Brantford, Ontario, Canada

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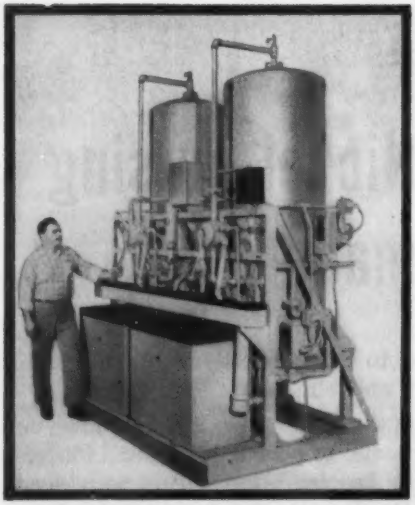

BARNSTEAD DEMINERALIZERS FOR METAL FINISHING IN CAPACITIES OF FROM 30 to 2500 G.P.H.

In rinsing or plating . . . in anodizing or make-up . . . in fact, wherever pure, mineral-free water is a necessity . . . Barnstead Demineralizers can save you money. First, because they are versatile: they come in all sizes from 30 to 2500 gallons per hour and in mixed-bed, two-bed, and four-bed models. Second, because they are low-cost in operation, producing pure water for as little as 5c per thousand gallons. Third, you get authoritative answers from Barnstead — with over 75 years' experience in ALL phases of producing pure water for all industrial applications.

NEW LITERATURE:

Catalog 127-A illustrates Barnstead's complete line of water demineralizers, and presents factual information which can help you reduce waste and save money.

Barnstead
STILL & DEMINERALIZER CO.

12 Lanseville Terrace, Boston 31, Mass.

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COMPLETE
- ZINC PLATING
- FINISHING SYSTEMS

EQUIPMENT AT

HOUDAILLE INDUSTRIES, INC.

North Chicago, Illinois

FOR SALE — INDIVIDUALLY — CAN BE INSPECTED ON ORIGINAL FOUNDATIONS— MUST BE SOLD IMMEDIATELY IN ORDER TO CLEAR THE BUILDING

COMPLETE SPRA-CON FINISHING SYSTEM, NEW 1956

Dual elevated gas fired bake oven 450° F. max. Work opening 26" wide x 42" high.
2 cooling tunnels, 2 dip tanks 20'6" x 2'6" wide x 4'4" deep.
Circulating filter system, heaters and dump valve. Complete CO^2 system.
Approx. 770' No. 348 monorail chain, track and trollies. Prewired panel board.
Including 2 stage steam heated washer 21' long x 5'8" wide x 9'4" high.

COMPLETE ZINC PLATING LINE, NEW 1956

Electrolytic zinc plating line, consisting of 18 tanks and 7 rinse stalls. All tanks 90" long x 54" deep x 24" and 60" wide, lined and unlined.
3 Chandeysson 12 volt, 6000 Amp., 440 volt motor generator sets with exciters. Industrial filters for zinc solution.
Overhead trolley system with 3 electric hoists. Approximately 15,000 pounds copper buss bar.

P. O. Box 2092, Chicago 9, Ill.
Phone LAfayette 3-3106, Chicago.

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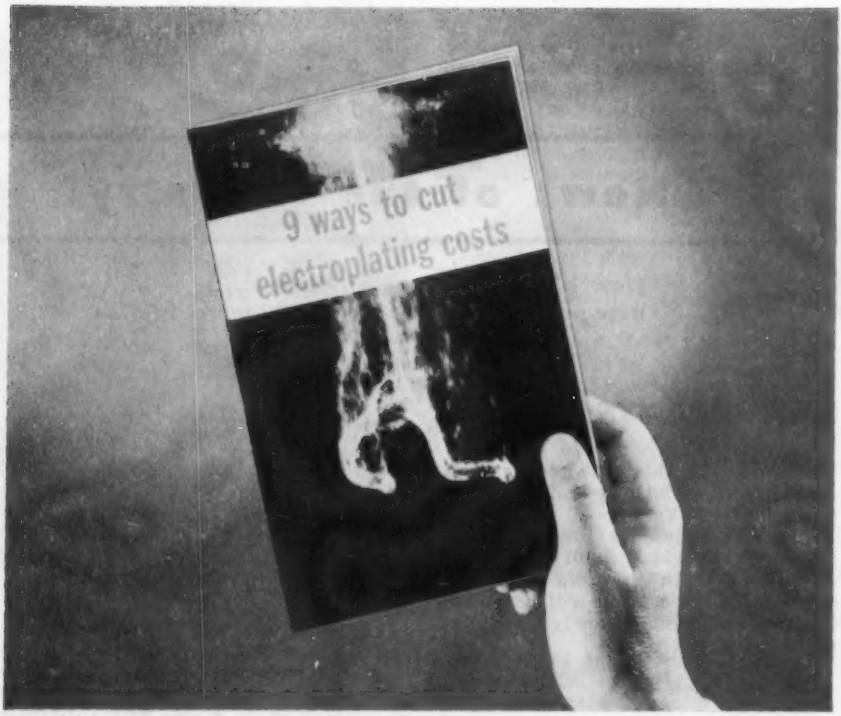


Order your free copy now

"9 WAYS TO CUT ELECTROPLATING COSTS" brings both new and old tricks-of-the-trade together in one handy booklet. These are practical tips and ideas you can use to lower production costs.

Of course, there are many other ways to reduce costs, depending on individual plant conditions. However, this booklet contains helpful reminders on those nine points that Diversey D-Man representatives have found *most vital* in economical electroplating.

The next time your D-Man calls to talk about electrocleaning chemicals, take a few minutes to chat with him about electroplating generally. He is well informed on new products and new techniques you can put to work in your plant.

Meanwhile, send in this coupon for your copy of this new booklet.

to: **Metal Industries Division**
The Diversey Corporation
1820 Roscoe Street
Chicago 13, Illinois

Please send me your new booklet, "*9 Ways To Cut Electroplating Costs.*"

name_____ title_____

company_____

street_____

city_____ state_____

For more data circle 399 on Reader Service Card

Page 140

News of the Industry

New plants . . . company news . . .
new positions . . . meetings . . . necrology . . .

NEW PLANTS

Wagner Brothers Inc., Detroit, Mich., has established a new branch office in New York.

The new office, at 109 Baker St., East Syracuse, N. Y., will cover all of New York state and northern Pennsylvania. Its operation will be directed by **Tom Kohler,** newly appointed district manager.

★ ★ ★

The **Hartford Steel Ball Company,** a leading manufacturer of precision balls, retainers and custom bearings, is building an addition to its No. 2 plant at Hanmer Street in Hartford, Conn. The addition will contain 8,400 square feet.

This addition will enable the main plant at Jefferson Avenue in West Hartford to concentrate on production of balls for barrel finishing. The precision ball department will be completely air conditioned and equipped with modern dust control.

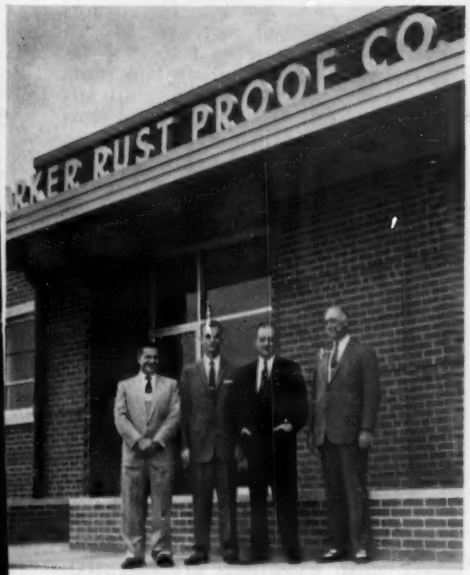
★ ★ ★

Parker Rust Proof Company, Detroit, has announced the opening of a new plant at St. Louis, Missouri. The firm manufactures an extensive line of products for the surface treatment of metals.

The 40,000-square-foot structure provides complete manufacturing and warehouse facilities to serve customers in the Midwest, South and Southwest.

Named as plant manager at St.

New plant built by Parker Rust Proof Company in St. Louis, Mo., contains 40,000 square feet of manufacturing and warehouse facilities for company's pretreatment products.



A group of officials pauses at the entrance of the Parker Rust Proof Company's new St. Louis plant during opening day inspection. From left to right, Ronald P. Gajdos, plant manager; Carl W. Moore, St. Louis regional sales manager for the firm; Robert W. Englehart, company president and John L. Christian, vice president of the Monsanto Chemical Company. Monsanto is a supplier of raw materials to Parker Rust Proof Co.

Louis was **Ronald P. Gajdos,** who formerly managed the company's New Jersey plant. Carl W. Moore is the southwestern regional sales manager.

★ ★ ★

A 1000-ton cob storage plant has been completed by **Ti-Co Industries, Inc.,** in Curtisville, Indiana.

The new facilities are adjacent to the company's cob-processing plant, which produces industrial cob grits, cob meal, cob flour, other products.

The company is currently processing from six to ten tons of cobs per day. Ti-Co's plant processes the coarse corn cob meal through 14 steps until four standard grades survive. The coarser grades of cob meal are used for blast cleaning. The finer grades find application as a material that is hard enough to burr and clean soft metals without damaging them.

★ ★ ★

The direct factory branch of **The DeVilbiss Company** in Atlanta has moved to new and larger quarters at 1100 Northside Drive, N.W.

The continued industrial growth of southeastern United States made necessary the expansion of the Atlanta branch, according to Henry M. Kidd, vice president-sales.

The new brick building has nearly 12,000 square feet of floor space, virtually double the room in the previous building.

Sales, service, repair and exchange, engineering and inventory will be maintained in the new building.

★ ★ ★

MacDermid, Incorporated, manufacturer of metal cleaning, plating and finishing chemicals, recently announced the opening of a West Coast division, MacDermid Pacific Incorporated.

Claude E. Weekly

Complete manufacturing, warehousing, sales and service facilities are now in operation. The new division, headed by **Claude E. Weekly,** former product service engineer, will have its headquarters temporarily located at 18802 Fonthill, Torrance, California.

Mr. Weekly has been active in all phases of cleaning, plating and finishing metals for twenty years. At various times in his career he has been a foreman, finishing room supervisor, metal finishing consultant and service

manager. He is a charter member and past-president of the Indianapolis Branch, American Electroplaters' Society.

COMPANIES

Dust and dirt, constant enemies of delicate mechanical systems, pose a serious problem for the makers of tiny instrument-type ball bearings used in precision instruments. To solve this problem, the Fafnir Bearing Company of New Britain, Conn., has constructed one of the most advanced and effective dust-free assembly and inspection departments in the instrument and ball bearing field. As part of a recently concluded million-dollar expansion program, Fafnir built what it calls "the world's cleanest metal-working factory area."

Pursuing its private war against dangerous dust and dirt, Fafnir outfits workers with lint-free Orlon uniforms made by **Worklon, Inc.** These uniforms possess all the attributes of duPont's Orlon acrylic fiber: they resist damage by acids and corrosive chemicals, by abrasion, greases, extremes of temperature, sunlight, soot, micro-organisms, bleaches, moisture; and they possess high tenacity and tensile strength. In addition, Worklon uniforms of lint-free Orlon are useful in precision work and other instances where clean conditions are essential.

Park No. 290
BLACKENING SALT

Black Oxide finishing for rust resistance and decorative parts. Speedy black coating in water solution with no electric current. Permanent black finish on ordnance parts, tools, aircraft, bearing races. Dazzling black decorative finish for television cameras, business machines, hardware, metal screens and machine parts. Excellent bond for paints and enamels. Simple one bath operation. Write for bulletin H-16. Park Chemical Co., 8078 Military Ave., Detroit 4, Mich.

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YES, IT'S PRACTICAL!

"I feel that I've learned a lot in a short time it would have taken years of experience to get," writes plater Tom Dincan of Tulsa, Oklahoma. Chances are, you too, can obtain a wonderful background in electroplating from ELECTROPLATING KNOW HOW, the unique home study course. Write Joseph B. Kushner, Electroplating School, 115 Broad St., Stroudsburg 30F, Pa., TODAY!

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TRADE MARK

Synthetic PEARL ESSENCE with the natural look!

PEARLESCENT FINISHES
BAKE OR AIR DRY FOR
Your Product Made of Metal, Plastic, Wood or Glass.
Write for sample. Specify application and choice of vehicle.
Natural Pearl Essence Prices on Request

RONA LABORATORIES, INC. East 21st and East 22nd Sts., Bayonne 4, N. J.
Plants: Maine • New Jersey • Canada

For more data circle 401 on Reader Service Card

Roto-Finish processes cut finishing costs, step up production

Savings on deburring, descaling, grinding, polishing, coloring and surface improvement by Roto-Finish barrel finishing processes are tremendous. Expensive hand finishing methods can be eliminated.

Roto-Finish Chips, Compounds and Machines are of the highest quality—Roto-Finish has never sacrificed quality for the sake of price. A continuous program of improvement of processes and products gives you better performance.

Roto-Finish guarantees results— There is no costly trial and error involved in the purchase of Roto-Finish equipment. You submit unfinished parts to Roto-Finish along with a finished sample and a description of the finish you require. These sample parts are processed by Roto-Finish to determine the right process to do the job. Roto-Finish guarantees to reproduce the same results in your plant, using Roto-Finish processes, that are achieved in sample processing.

Send for this Free Technical Data Folder

Roto-Finish

ROTO FINISH

COMPANY

P. O. Box 988
Phone FI 3-5578

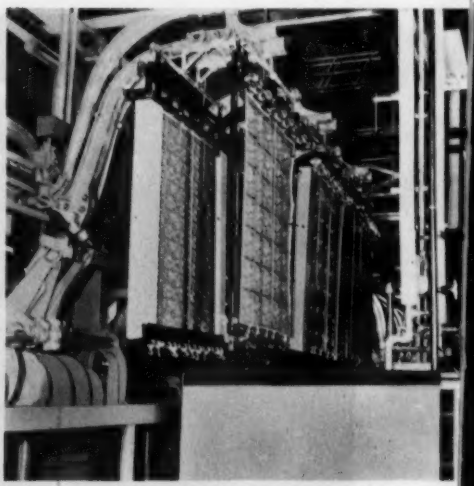
3704 Milham Rd., Kalamazoo, Mich.

For more data circle **403** on Reader Service Card

An automatic production line for plating printed circuits, incorporating a Stevens Automatic Processing Machine, was recently engineered by **Frederic B. Stevens, Inc.**, Detroit, Michigan.

The machine is designed for copper plating circuits and is capable of producing over five million individual circuit boards annually.

The plating tank is 75 feet long. Each individual arm holds two racks, each rack holding 24 plastic boards in position for the electrolytic deposition of the copper wire patterns.



Automatic production line for plating printed circuits: over five million annually

TRUE BRITE BRASS SOLUTION

A foolproof solution which has been in use over 6 years in light and heavy production.

- Ready To Use—Just Add Water
- No Variance in Color
- Trouble-Free—Little Supervision Needed
- Low Cost—Additions only once a day

Available in a variety of colors. Will match your sample.

Write for technical bulletin and prices.

TRUE BRITE CHEMICAL PRODUCTS CO.
Box 31, Oakville, Conn.

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from wash thinners, spoiled lacquers, degreasing machine sludge, etc.
Solvents recovered by the Lofgren Process. Each customer's shipment, whether one drum or a carload, receives proper and separate treatment. Write to:

Solvents Recovery Service, Inc.
1025 Broad St. Newark 2, New Jersey
Hammond Solvents Recovery Service
241 Brunswick Rd. Hammond, Ind.

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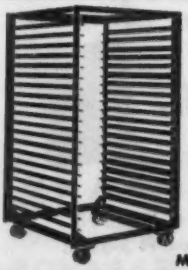

USE WILDER RACK TRUCKS
FOR
INCREASED PRODUCTION
AND
GREATER OVEN CAPACITY
Write for further information.
WILDER MFG. CO., INC.
DEPT. H
MECHANIC ST. & ERIE R.R., PORT JERVIS, N. Y.

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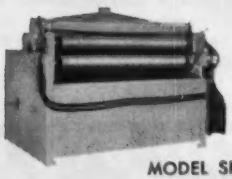
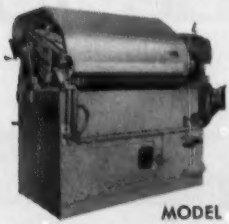
TIMESAVER *SPEEDBELT** ABRASIVE MACHINES



MODEL SPL
24", 36" & 50" belt widths



MODEL TOP
24", 36", 50" & 54" belt widths

Both Models of the Timesaver "Speedbelt" Abrasive Machine can be used in tandem for automatic polishing of tops and bottoms of material being processed . . . in one operation.

Mechanize polishing of aluminum, stainless steel and other metal sheets, bars and blanks — perforated or solid

TIMESAVER *SPEEDBELT* Abrasive Machines are the fastest and easiest machines to set-up for production polishing schedules on the market today. Abrasive belts with grit range from 40 to 220 can be changed in 5 minutes or less. Adjustment for stock thickness can be made in seconds. Feed speed is variable from 35 to 80 SFM with lower or higher speeds optional In addition to polishing, Timesaver Machines are used for metal finishing and deburring operations.

Write Today . . . send for the on-the-job story of Timesaver Machines polishing metal grilles and folder describing in detail all the Timesaver features, construction and specifications.

TIMESAVER SANDERS

P.O. BOX 7446 • ROBBINSDALE STATION
MINNEAPOLIS 22, MINNESOTA

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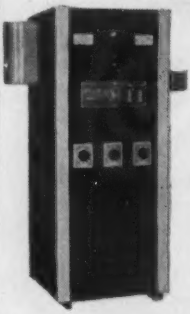
SOCIETIES

Electroplaters in the Virginia-Carolina area have applied for a temporary charter as the **Blue Ridge Branch** of the **American Electroplaters' Society.** At the September 6 meeting, held in Roanoke, Virginia, the following officers were elected: **T. R. Boggess,** president; **Nelson F. Murphy,** 1st vice president; **Bruce Wallace,** 2nd vice president; **Carl Witherspoon,** secretary-treasurer; **Paul Callahan,** librarian; **S. H. Reynolds,** chaplain; **Tom Johnson, Howard Weaver,** and **Howard Welfare,** members of the Board of Managers.

Dressed in the traditional Scottish Tam, Kilt and Sporan of the "MacDermid Clan," Harold Leever, president of MacDermid Incorporated, Waterbury, Connecticut manufacturer of metal cleaning, plating and finishing chemicals, presents a special Wives' Award to Mrs. Cecil Thornton. Looking on is Cecil Thornton, Rochester, New York Sales Representative, holding his 20-year Service Award.

GERMANIUM
rectifiers



- SEALED JUNCTIONS
- COMPACT
- LONG LIVED

Catalog available on request

95% Efficiency at full load is standard with the new RAPID GERMANIUM RECTIFIERS.

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GOOD BYE to PIPE COILS

Old-style pipe coils are obsolete for phosphating, degreasing, plating, cleaning, drying, etc. The Dean Thermo-Panel Coil TAKES THE PLACE of pipe coils. Tell us your heat transfer problems.

DEAN THERMO-PANEL COIL DIVISION
DEAN PRODUCTS, INC. 622 Franklin Ave
BROOKLYN 38, N. Y. Tel. STerling 9-5400

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MORSE DRUM DOLLY No. 13

Perfect for vertical handling of open end drums. Easily handles loads up to 700 lbs. Built of 2½" steel for long life. 24" diameter; overall height 6½". Has four 3" dia. steel swivel casters for easy rolling into small areas. Rubber wheels available.

MORSE MFG. CO., INC. $10.90 FOB
762 W. Manlius St., E. Syracuse, New York

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Flat Polish Faster Smoother... and Use Fewer Belts!

Sharper Cutting, Cleaner Cutting Michigan Belts will do it for YOU!

If you're flat polishing you're after *surface*. And with Michigan Abrasive **RED COAT** brand belts you get the surface you want faster and with the same characteristics run after run.

Illustration shows the **RED COAT** belt spark pattern is concentrated close to the sheet . . . hot waste particles are thrown off—not carried by the belt. The fact that **RED COAT** belts resist loading is just one reason they cut sharper, longer . . . give you better results. You can *see* how sharper cutting Michigan belts mean savings in time and money. Just check the *perfect finishes* produced on sheets that had especially bad surfaces before a *single pass* through your machines. You have fewer rejects—spend less time in handling and second runs.

Like all Michigan belts, sheets and discs, **RED COAT** flat polishing belts produce the results users want. They produce them faster, longer and at less cost. The right coated abrasive you need for any job is listed in our big free catalog! Send for it today and call your Michigan representative the next time you order any coated abrasives. You'll enjoy using the best . . . Michigan

MICHIGAN ABRASIVE CO.

Manufacturers of "The Humidity Controlled Abrasive"

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I want more information on Michigan Abrasives!

☐ Send your Catalog ☐ Have representative call.

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RED COAT BRAND

Michigan ABRASIVES

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Blue Ridge Branch, A. E. S., held a dinner meeting on Sept. 6. The speaker, Ezra A. Blount, urged those present to attend the 1958 A. E. S. Convention to be held May 19-22 in Cincinnati. (PRODUCTS FINISHING Staff Photograph)

Speaker of the evening was **Ezra A. Blount,** editor of PRODUCTS FINISHING, who discussed, "Methods of Conducting Classes for Electroplaters." Mr. Blount also showed color movies taken in Japan.

A New Jersey man has been named to the executive secretary's post of one of the largest affiliates of the **National Association of Metal Finishers. Alfred T. Marinaro** assumed his duties as chief administrator of the **Masters' Electro-Plating Association** of New York last month, filling the vacancy created by the death of Silvio C. Taormina in June. This an-

A. T. Marinaro

QUALITY EQUIPMENT

PRICED RIGHT AND READY FOR IMMEDIATE SHIPMENT

BUFFING AND POLISHING EQUIPMENT

100 Hammond—Divine—U. S. Electric—Holland — Standard Electric — L'Hommedieu single speed and variable speed buffing and polishing machines. 1 to 20 HP.

6 Rotary Machines: Hammond—Acme—Packermatic.

Complete buffing systems for above machines, including hoods, cyclones, dust boxes, pipes, motors and blowers; various sizes.

Semi-automatic machines: Buffalo—Hammond Acme—Divine—Production.

ALL EQUIPMENT IN STOCK
INSPECTION INVITED

all quoted subject to prior sale.

J. HOLLAND & SONS, INC.

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Buff Cooler, Faster with 45° Spoke Buffs

Patented mounting maintains best cutting angle of 45° for faster, smoother cutting with less pressure. Ventilation from 24 openings. We also mfg. all types of buffs.

Write for folder.

GUARANTEED BUFF CO., INC.

20 Vandam St. New York 13, N. Y.

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The Mississippi Valley Branch, A. E. S., inaugurated their organic division with a dinner meeting on Sept. 18 in Moline, Illinois. Ezra A. Blount, editor of PRODUCTS FINISHING, discussed "Paint Application Methods." (PRODUCTS FINISHING Staff Photograph)

nouncement was made by Sal Novelli, chairman of the MEPA.

Mr. Marinaro is managing director of Platers' Technical Service, Inc. and Platers' Research Corp., of New York and Chicago.

NECROLOGY

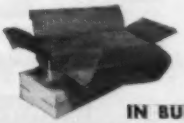
William J. Magee, retired treasurer and director of **Norton Company,** died August 26 at the age of 68.

Bond® TACK CLOTH *for a* **SPECK-FREE FINISH EVERY TIME!**

SAVE TIME AND WORK WITH BOND TACK CLOTHS — NOW AVAILABLE IN HANDY ROLLS OR CUT BULK—WHITE OR GOLD —IN FOUR DIFFERENT TYPES OF CLOTH

Get your Tack Cloth packed just the way it's easiest for you to use . . . either in 150 yard rolls of 36" wide cloth or in handy cartons . . . 100 or more Tack Cloths to the carton.
No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up! The Cut Bulk size is 18" x 36" . . . folded to 4½" x 18" or 9" x 18" for ease of handling. ALL BOND TACK CLOTH is Spontaneous Combustion Proof, Lint-Free, and Wax-Free. Gives a sparkling speck-free Finish every time. Clean and Sanitary. No waste. Choice of Standard, Extra Tacky or Less Tacky.

IN ROLLS
Cut off any size piece to use as needed



IN BULK
Cut and folded. Ready to use.

TRY THEM AND COMPARE RESULTS.
Samples Gladly Sent Upon Request.

Bond® CHEMICAL PRODUCTS CO. 2639 N. CLYBOURN AVE. CHICAGO 14, ILLINOIS
"The Tacky Wiper Specialist"

ALSO INDIVIDUALLY PACKED IN GLASSINE ENVELOPES—144 TO THE CARTON. A WARRANTY OF SATISFACTION IN EVERY CARTON.

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Mr. Magee retired February 1, 1955, after a career of 25 years in various financial positions at the company. He was controller from 1934 to 1941, assistant treasurer until 1946 when he became treasurer and director. In addition, he served as treasurer of Norton Behr-Manning Overseas, Inc., the company's overseas sales and manufacturing division, and Norton Company of Canada, Ltd., of Hamilton, Ontario.

★ ★ ★

Frederick Gumm, president of the Frederick Gumm Chemical Company, Kearny, N. J., died recently after a brief illness.

Mr. Gumm had been active in the electroplating industry for just short of a half century and his passing will be a loss to many of the elder generation of platers. He was well-known and active for many years in the American Electroplaters' Society and the International Fellowship Club.

Where To Buy It

For sources of equipment, materials and processes used in the Finishing Industry, refer to the

Products Finishing DIRECTORY

MEETINGS of INTEREST to FINISHERS

Oct. 9-11. 4th Annual Symposium of High Vacuum Technology, Hotel Somerset, Boston, Mass.

Oct. 21-24. 60th Annual Convention, International Association of Electrotypers and Stereotypers, Inc., Americana Hotel, Miami Beach, Fla.

Oct. 30. Technical Conference, Society of Vacuum Coaters, Hotel Statler, Cleveland, Ohio.

Oct. 30-Nov. 2. 22nd Paint Industries' Show and 35th Annual Meeting, Federation of Paint and Varnish Production Clubs, Bellevue-Stratford Hotel, Philadelphia, Pa.

Nov. 2. Annual Educational Session and Banquet, Philadelphia Branch, A.E.S., Penn-Sheraton Hotel, Philadelphia, Pa.

Nov. 4-8. 39th National Metal Congress and Exposition, International Amphitheatre, Chicago, Ill.

Nov. 6-8. 19th Annual Shop Practice Forum, Porcelain Enamel Institute, Ohio State University, Columbus, Ohio.

Feb. 1. Annual Educational Session and Banquet, New York Branch, A.E.S., Hotel Statler, New York, N. Y.

Feb. 3-6. National Industrial Electric Heating Conference, Netherland-Hilton Hotel, Cincinnati, Ohio.

Feb. 14-15. Third Annual Technical Session and Banquet, Southeastern Branch, A.E.S., Dinkler Plaza Hotel, Atlanta, Ga.

May 19-22, 1958. 45th Annual Convention, A.E.S., Hotel Sheraton-Gibson, Cincinnati, Ohio.

"GRIPALLOY"

. . . Attractive satin sheen primer in black and colors . . .
. . . Amazing tight adhesion to 25 different metals as reported by a large electrical manufacturer . . .
. . . Excellent resistance to Salt Spray, Gasoline and Solvents.

TENAX, Newark, N. J.
Lacquers—Enamels
Synthetics—Varnishes

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McKeon's "Liquid Sulphur"

Economical, fast, non-electrolytic.

Sulphur Products Co., Inc.

McKeon Bldg., 621 W. Pittsburgh St., Greensburg, Pa.

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Looking for more "shots per dollar" in vacuum metallizing coils?

By switching to the best coil design, vacuum metallizers have realized as much as 30% more shots per dollar from Sylvania Tungsten Coils. Why is this possible? Because Sylvania helps vacuum metallizers find the right coil to do their job most economically. Whether you buy ready-made coils or form your own from tungsten strand, Sylvania is ready to help you get maximum efficiency.

Sylvania coils are formed of high density tungsten strand manufactured to exacting standards of quality control. Sylvania Tungsten Strand is available in 3 to 7 ply with wire diameters of 0.020 to 0.600 inches per strand.

We invite you to write, outlining your specific requirements and problems.

SYLVANIA ELECTRIC PRODUCTS INC.
Tungsten and Chemical Division,
Towanda, Penna.

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SYLVANIA

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PRODUCT LITERATURE

52. Polishing Machines
Folder describes in detail the features of Timesavers polishing machines, includes specifications and construction features. Describes installation where these machines are being used to polish metal grilles. Timesaver Sanders, P. O. Box 7446, Robbinsdale Sta., Minneapolis 22, Minnesota.

53. Rectifiers
Data sheet on rectifiers equipped with "Dual-O-Matic" Control. This type of transformer circuit permits the maximum name-plate amperage to be drawn on either the 2- or 12-volt operating range without reconnecting external d.c. bus in series or parallel connection. Clinton Supply Co., 110-112 S. Clinton St., Chicago 6, Ill.

54. Corrosion-Resistant Drums
Data on drums coated inside and out with corrosion-resistant Miccrosol. Michigan Chrome & Chemical Co., 8615 Grinnell Ave., Detroit 13, Mich.

55. Automation
Bulletin FAC-103 describes full-automatic conveyors, tells how they bring automation to electroplating, anodizing, metal cleaning, phosphatizing and pickling. Hanson-Van Winkle-Munning Co., Matawan, N. J.

56. Dial Thermometers
Bulletin No. 1100-B describes dial thermometers, where they should be used, how they operate, etc. Sarco Co., Inc., 635 Madison Ave., New York 22, N. Y.

57. Roller Coating
Folder describes Gasway Rollacoating units, cleaning and treating units, drying units, and strip accumulators for coating metals in strip form. Gasway Corporation, 6465 N. Ravenswood Ave., Chicago 26, Ill.

58. Flocking Machine
Bulletin outlines operation of, gives details on Peco Model 7 flocking machine. Progressive Equipment Co., 8629 Mackinaw at Grand River, Detroit 4, Mich.

59. Quartz Ovens
Brochure No. Q-3-76 describes Fannon Quartz Infra-Red Ovens. Includes discussion of efficiency, performance, features. Photographs show typical installations. John J. Fannon Products Co., 1469 Algonquin Ave., Detroit 15, Mich.

60. Deionization Equipment
Bulletin describes mixed-bed deionization; two-bed deionization; softeners; filters of various types; and special-purpose equipment. Illinois Water Treatment Co., 840 Cedar St., Rockford, Ill.

61. Wash Primers
Description of wash primers based on Butvar and Formvar resins includes discussion of advantageous features of such coatings. Shawinigan Resins Corporation, Springfield 1, Mass.

62. Radiant Heat
Bulletin 57-108 describes the various applications of radiant heating equipment in metal processing. Eighteen typical applications are described in capsule case-history form. Data on product heating problems, processing temperatures, time cycles and oven design are included. Of special interest is a description of Fostoria's four sources of infrared energy and where they are best applied to metalworking heating processes. Fostoria Pressed Steel Corp., Fostoria, Ohio.

63. Pipe and Fittings
Bulletin No. 139 describes line of tin-lined pipe, fittings, line valves, faucets and accessories developed especially to protect distilled or demineralized water from metallic contamination. Barnstead Still & Demineralizer Co., 130 Lanesville Terrace, Boston 31, Mass.

64. High-Vacuum Valves
A 32-page engineering manual describing and illustrating a comprehensive line of high vacuum valves. Includes a discussion of the requirements imposed by high vacuum service. NRC Equipment Corp., 160 Charlemont St., Newton 61, Mass.

65. Emulsion Cleaner
Emulsion cleaner No. 26 is a cold organic emulsion cleaner used for removing heavy oils, greases and dirt from metals. This heavy-duty cleaner with penetrating, wetting and emulsifying powers will quickly loosen and emulsify any oil, grease or soil, leaving the surface clean for subsequent operations, the manufacturer states. Mitchell-Bradford Chemical Co., Wampus Lane, Milford, Conn.

66. Metal Strippers
Two acid electrolytic strips are described in Technical Data Sheet No. 20, a three-page usage and instruction sheet. Both strongly acidic solutions, these strips are used with current, and will not attack base metals. Used to strip chromium, nickel, copper or bronze plate from zinc-base diecastings, Metex DB Strip also strips nickel plate from brass; and copper, nickel or chromium from aluminum. Metex XB Strip removes copper, nickel and chromium platings from zinc base diecastings. MacDermid, Incorporated, Waterbury, Connecticut.

67. Ultrasonic Gaging
Two ultrasonic testing bulletins. These application data sheets discuss the uses of the Vidigage, an ultrasonic resonance instrument, for quick and accurate detection of corrosion and laminar flaws, and the measuring of metal or plastic thicknesses. Advantages of ultrasonic corrosion inspection are discussed in Bulletin V-301. Bulletin V-302 describes methods of ultrasonic flaw detection. The Vidigage will instantly locate internal discontinuities in regularly shaped metals and plastics. Branson Instruments, Inc., 40 Brown House Rd., Stamford, Conn.

68. Drum Cleaning
Fast, efficient removal of dirt, rust, paint and other foreign materials from drum exteriors, interiors and lids by Rotoblasting is described in a new four-page specification bulletin. Pangborn Corporation, 5000 Pangborn Blvd., Hagerstown, Md.

69. Chromic Acid
"What Every User Should Know About Chromic Acid" is the subject of an informative 8-page booklet. This booklet describes in detail the process of manufacture and discusses the problems involved in quality control. Better Finishes & Coatings, Inc., 268 Doremus Avenue, Newark 5, New Jersey.

70. Chemical Polish Aluminum
Full details on chemically polishing aluminum with Alchemize solutions. Alchemize Corp., 1429 S. Talman Ave., Chicago 8, Ill.

71. Polishing and Buffing Equipment
Description of a complete line of automatic polishing and buffing machines, including specifications and other data for these machines. Acme Manufacturing Co., 1400 E. Nine Mile Rd., Detroit 20, Mich.

72. Bright Gold
Literature gives details on the Sel-Rex Bright Gold Process. Sel-Rex Corporation, Precious Metals Div., Nutley 10, N. J.

73. Conveyorized Paint Finishing
Portfolio of data bulletins tells how plants have improved products and production by installing complete Koch finishing systems. Geo. Koch Sons, Inc., Evansville, Ind.

74. Pneumatic Sander
Information on the Easy Dual Action Sander. Detroit Surfacing Machine Co., 1266 East Eight Mile Rd., Detroit 20, Mich.

75. Spray Equipment
A 32-page book contains information on a complete line of spray painting equipment, including such data as flow rate and pipe size tables, installation data, and many other facts pertinent to spray painting. Alemite Div., Stewart-Warner Corporation, Dept. AF-107, 1850 Diversey Parkway, Chicago 14, Ill.

76. "Teflon" Lined Pipe
Bulletin T-100 describes the application of "Teflon" as a liner for steel pipe. Pipe lined with "Teflon" will withstand severely corrosive conditions and temperatures as high as 350 deg. F. Halocarbon Division, Haveg Industries, Inc., 914 Greenbank Rd., Wilmington 8, Del.

77. Finishing Systems
Catalog A-657 gives illustrated data on Mahon complete finishing systems. R. C. Mahon Co., Detroit 34, Mich.

78. Vacuum Coaters
Information on the vacuum metalizing process and CEC Vacuum Coaters. Consolidated Electrodynamics Corporation, Rochester Div., Rochester 3, N. Y.

79. Degreasing Solvent
Information on Nialk Trichlorethylene degreasing solvent. Hooker Electrochemical Co., 1406 Union St., Niagara Falls, N. Y.

80. Conveyors
Literature on Richards-Wilcox "Zig-Zag" Conveyors. Richards-Wilcox Manufacturing Co., Materials Handling Div., 100 W. Third St., Aurora, Ill.

81. Thickness Tester
Description of the Kocour Model 955 electronic plating thickness tester. Kocour Co., 4814 S. St. Louis Ave., Chicago 32, Ill.

82. Airless Spray
Data on the airless spray painting process, whereby the paint is atomized by hydraulic pressure and heat rather than air. Bede Products Corporation, Jackson St., Dept. 1, Amherst, Ohio.

83. Buffing and Polishing Compositions
Information on Buckingham buffing and polishing compositions. The Buckingham Products Co., 14100 Fullerton Ave., Detroit 27, Mich.

84. Polishing-Grinding Wheels
Brochure entitled "'PG' Wheel Production Reports." Minnesota Mining and Mfg. Co., St. Paul 6, Minn.

85. Paint Finishing Systems
Information on complete, integrated paint-finishing systems. Peters-Dalton, Inc., 17908 Ryan Rd., Detroit 12, Mich.

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86. Quartz Immersion Heaters
Illustrated bulletin on Vitreosil Fused Quartz Immersion Heaters. Thermal American Fused Quartz Co., Inc., 18-20 Salem St., Dover, N. J.

87. Cleaning Methods
Handbook of production-line cleaning methods contains valuable reference data on metal cleaning. Magnus Chemical Co., Inc., Industrial Cleaning Div., 208 South Ave., Garwood, N. J.

88. Industrial Gloves
Catalog describes complete line of industrial gloves for use in a wide variety of applications. Pioneer Rubber Co., 285 Tiffin Rd., Willard, Ohio.

89. Anti-Mist
Literature describes Zero-Mist H.T., an additive that suppresses fumes from chromium plating tanks. Udylite Corp., Detroit 11, Mich.

90. Control Booklet
A daily control booklet for recording control operations on three- and five-stage washers. The DuBois Co., Inc., 1120 W. Front St., Cincinnati 3, Ohio.

91. Barrel Finishing
Technical Data Folder contains information on deburring, descaling, polishing, coloring and surface improvement by the Roto-Finish Process. Roto-Finish Co., 3704 Milham Rd., Kalamazoo, Mich.

92. Stripper
Data on Lea Synstrip, a stripper for removing lacquer and synthetic coatings quickly and easily. The Lea Manufacturing Co., 16 Cherry Ave., Waterbury 20, Conn.

93. Phosphates
Information on zinc-iron phosphates, iron phosphates, and phosphates for cold extrusions. Detrex Chemical Industries, Inc., Box 501-A, Detroit 32, Mich.

94. Electrostatic Spray
Literature on the Ionic Electrostatic Spray painting process. Ionic Electrostatic Corporation, 111 Monroe St., Garfield, N. J.

95. Degreasers
Literature describes patented solvent cooler that is said to chill the solvent distillate to speed up complete and constant separation of water and solvent. G. S. Blakeslee & Co., 1844 S. Laramie Ave., Chicago 50, Ill.

96. Blast Grit
Technical brochure describes many grades of Black Beauty Blast Grit. H. B. Reed & Co., Inc., 6618-P Kennedy Ave., Hammond, Ind.

97. Fume Elimination
Literature on catalytic fume oxidants that remove odors and fumes from oven exhausts. Oxy-Catalyst, Inc., Industrial Div., Wayne, Pa.

98. Abrasive Belts
Literature describes Red Coat Abrasive Belts. Michigan Abrasive Co., 11910 E. 8-Mile Rd., Detroit 5, Mich.

99. Automatic Polishing Machines
Information on Packer-Matic Automatic Polishing and Buffing Machines. The Packer Machine Co., Meriden, Conn.

100. Conveyor
Bulletin LS-1 describes Landahl overhead conveyors for use in finishing plants. Landahl Chainless Conveyor Co., Sub. of the American Monorail Co., 13142 Athens Ave., Cleveland 7, Ohio.

101. Bright Nickel
Data on Nubrite bright nickel plating process. Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

102. Rinse Aid
Information on Rins-Aid, an additive for use in water rinses to prevent staining, tarnishing, and facilitate drying of plated parts. R. O. Hull & Co., Inc., 1304 Parsons Ct., Rocky River 16, Ohio.

103. Clear Lacquer
Information on Nikolas 2105 Clear Lactecting plated finishes from oxidation and marring. G. J. Nikolas & Co., Inc., 2880 Washington Blvd., Bellwood, Ill.

104. Conveyor
Planning folder gives complete details on Chainveyor Overhead Conveyor Systems. Chainveyor Corporation, 5618 E. Washington Blvd., Los Angeles, Calif.

105. Ovens
Information on ovens designed for conveyorized finishing systems, batch finishing, laboratory use, special processes. Industrial Ovens, Inc., 13811 Triskett Rd., Cleveland 11, Ohio.

106. Copper Plating
Information on the advantages of using OFHC Copper Anodes. The American Metal Co., Ltd., 61 Broadway, New York 6, N. Y.

107. Metal Cleaning
Information on Pennsalt cleaners and phosphatizing compounds. Pennsalt Chemicals Corp., 3 Penn Center Plaza, Philadelphia 2, Pa.

108. Barrel Finishing Handbook
A 52-page handbook on barrel finishing contains useful information on this process. Almco Div., Queen Stove Wks., Inc., 88 Marshall St., Albert Lea, Minn.

109. Setting Up Polishing Wheels
Booklet entitled "Setting Up Metal Polishing Wheels and Belts" contains information on the best methods of preparing wheels, with cement or glue. Norton Company, Worcester 6, Mass.

110. Stripping Metals
"Enstrips" booklet describes products for dissolving one metal from another, quickly. Enthone, Inc., 442 Elm St., New Haven 11, Conn.

111. Buffing Irregular Shapes
Information on a new 6-inch-wide finger buff that is said to be advantageous for buffing irregular shapes without excessive wear on any part of the face. Geo. R. Churchill Co., Inc., Dept. PF, Hingham, Mass.

112. Extrusion Finisher
Data on the Hammond Reversing Extrusion Finisher, a machine designed for volume production finishing of extrusions, trim and mouldings. Hammond Mchry. Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich.

113. Phosphate Coatings
Bulletin 1424 describes the various types of ACP Alodine and gives information which will help you select the proper one for a particular application. American Chemical Paint Co., Ambler 14, Pa.

114. Anode for Chromium Plating
Bulletin RRA-1 describes new style round anode with a ribbed perimeter. This anode is said to aid in prevention of trivalent chromium buildup where cathode area is large. Metal & Thermit Corporation, Rahway, N. J.

115. Plating Waste Recovery Systems
Literature on plating bath recovery equipment that uses an evaporation process to recover solutions. Industrial Filter & Pump Mfg. Co., 5904 Ogden Ave., Chicago 50, Ill.

116. Cleaning Bulletin
Technical Bulletin on Cowles QC Cleaner. Cowles Chemical Co., 7016 Euclid Ave., Cleveland 3, Ohio.

117. Degreasing Solvent
Information on trichlorethylene degreasing solvent and its advantages. Dow Chemical Co., Midland, Mich.

118. Buffs
Data on bias cloth, bias sisal and unit cloth or sisal buffs. American Buff Co., 2414 S. LaSalle St., Chicago 16, Ill.

119. Aluminum Conversion Coatings
Bulletin describes Golden Bonderite, and its companion product, Green Bonderite, used to prepare aluminum for painting. Parker Rust Proof Co., 2172 E. Milwaukee, Detroit 11, Mich.

120. Tumbling Media
Booklet A-1461 gives technical information on abrasives used in tumbling. The Carborundum Co., Niagara Falls, N. Y.

121. Electrostatic Painting
Details on the Ransburg No. 2 Process for applying paint electrostatically. Ransburg Electro-Coating Corp., Indianapolis 7, Ind.

122. Hot Spray
Literature on Spee-Flo hot spray systems. Spee-Flo Manufacturing Corp., 720 Polk Ave., Houston, Texas.

123. Washer
Information on the Ransohoff cabinet-type inter-process washer, designed for washing parts between machining operations. Ransohoff, Inc., 610 N. Fifth St., Hamilton, Ohio.

124. Buffing Compound
Information on Stutz Liquispray Buffing Compound. The Stutz Co., 4410 Carroll Ave., Chicago 24, Ill.

125. Chemical Polishing
Complete literature and data on chemical polishing Iridite. Allied Research Products, Inc., 4004-06 East Monument St., Baltimore 5, Md.

126. Ovens
Catalog describes Rockwell Recirculating Ovens. W. S. Rockwell Co., 2907 Eliot St., Fairfield, Conn.

127. Cut Costs
Booklet entitled "9 Ways to Cut Electroplating Costs." Diversey Corporation, 1820 Roscoe St., Chicago 13, Ill.

128. Panel Heaters
Bulletin 355 contains 52 pages of technical information on Dean Thermo-Panel Coils for immersion heating and heat exchange. Dean Thermo-Panel Coil Div., Dean Products, Inc., 622 Franklin Ave., Brooklyn 38, N. Y.

129. Vapor Degreasers
Catalog describes complete line of vapor degreasers, including the Rotomatic degreaser, which incorporates a liquid dip in the cycle. Phillips Mfg. Co., 3457 W. Touhy Ave., Chicago 45, Ill.

130. Automatic Plating Machine
Information on the Wagner "Tadmu," a newly designed automatic plating machine. Wagner Bros., Inc., Detroit, Mich.

131. Cleaning Compound
Data on Apex 749 Cleaning Compound, which is designed for use in spray washing machines to remove chlorinated and pigmented drawing lubricants. Apex Alkali Products Co., Main & Rector Sts., Philadelphia 27, Pa.

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132. Plating Machine
A fully automatic plating and anodizing machine is described in an 8-page bulletin. The Cycleflex can produce up to 240 racks per hour when arranged with double-lane plating or anodizing unit. Operation is from a single control panel. Lasalco, Inc., 2820 LaSalle St., St. Louis 4, Mo.

133. Rectifiers
Selenium, germanium and silicon rectifiers for electroplating, anodizing and all electro-chemical processing are described. Frederic B. Stevens, Inc., 1800 Eighteenth St., Detroit 16, Mich.

134. Reverse-Current Cleaner
Service report describes the use of Oakite Composition No. 90 for reverse current cleaning of steel before plating. Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

135. Cutting Barrels
Literature gives details on how Hartford's enclosed barrel speeds deburring, descaling and polishing of screw machine parts, stampings and castings. Hartford Steel Ball Co., Inc., 121 Jefferson Ave., West Hartford 6, Conn.

136. Hot Spray Unit
Information on a hot spray process that uses no moving parts to heat the paint. Air used in atomizing the paint is heated, and it in turn heats the paint. Thermospray Co., Inc., 60 E. 42nd St., New York 17, N. Y.

137. Solvent Vapor Degreaser
Information on compact Model 22 vapor degreaser. Tect, Inc., Dumont, N. J.

138. Stripping Copper
Brochure tells how to strip copper with McKeon's Liquid Sulphur. Sulphur Products Co., Inc., McKeon Bldg., 621 W. Pittsburgh St., Greensburg, Pa.

139. Bright Brass Plating
Technical bulletin gives detailed information on True Brite Brass Solution, said to produce exceptionally uniform deposits of brass. True Brite Chemical Products Co., Box 31, Oakville, Conn.

140. Buffs and Compounds
Catalog describes and illustrates various cloth and sisal buffs, buffing compounds, contact wheels and abrasive belt grease sticks. Formax Mfg. Corp., Detroit 7, Mich.

141. Buffs
Data on air-cooled Ventex Buffs with permanent or removable centers. Bison Corp., 1935 Allen Ave., S.E., Canton, Ohio.

142. Filter Pump
Information on the Sethco double-cartridge, self-priming filter pump. Sethco Mfg. Co., 70-72 Willoughby St., Brooklyn 1, N. Y.

143. Thickness Tester
Dermitron non destructive thickness tester will check the thickness of metals on metals, non-conductors on metals, and metals on non-conductors without destroying the coating. Unit Process Assemblies, Inc., 61 E. Fourth St., New York 3, N. Y.

144. Acrylic Coatings
Performance and application information on acrylic-based coatings. The Varnish Products Co., 5204 Harvard Ave., Cleveland, Ohio.

145. Phosphatizing Large Areas
Bulletin 55-137 tells how to phosphatize large, bulky equipment such as cabinets, trucks, trailers, busses, and farm implements with Phosteem, a new process for cleaning and phosphatizing metal surfaces. Neilson Chemical Co., 6561 Benson St., Detroit 7, Mich.

146. More Paint Per Coat
Bulletin F-286 gives facts on how hot spray process can aid in producing a heavier film in a single application of paint. The DeVilbiss Co., Toledo 1, Ohio.

147. Spray Nozzles
Catalog 24 contains complete information on many types and sizes of nozzles. Spraying Systems Co., 3229 Randolph St., Bellwood, Ill.

148. Primer
Data on Gripalloy, a satin-sheen primer in black and colors. Tenax Finishing Products Co., Newark, New Jersey.

149. Ovens
Catalog describes and illustrates various types and sizes of paint-baking ovens. Lanly Co., 770 Prospect Ave., Cleveland, Ohio.

150. Drying Ovens
Information on paint drying ovens. The Carl Mayer Corp., 3030 Euclid Ave., Cleveland 15, Ohio.

151. Gold Finishes
Description of air-dry and baking-type gold finishes. Duralac Chemical Corp., 84 Lister Ave., Newark 5, N. J.

152. Heat-Resistant Finish
Literature describes properties of Sicon, a silicone-based finish said to have excellent resistance to heat. Midland Industrial Finishes Co., Dept. F-6, Waukegan, Ill.

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National manufacturer of complete line of industrial product finishes including lacquers, enamels and synthetics has opening for Technical Service Representative with headquarters in Kansas. Salary and bonus plan. Inquiries will be held strictly confidential. Reply Box No. 105 c/o PRODUCTS FINISHING, 431 Main Street, Cincinnati 2, Ohio.

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- Practical experience in Fats, Oils, Waxes of Animal, Vegetable and Petroleum origin.
- Sales or Factory experience among metal working industries desirable.
- Remuneration—Commensurate with ability and qualifications.
- Location away from large cities in town of 10,000, where living conditions and recreational facilities are most attractive.

All replies held confidential.

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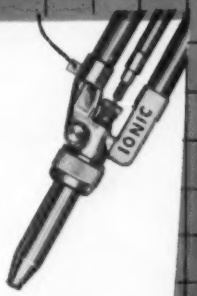

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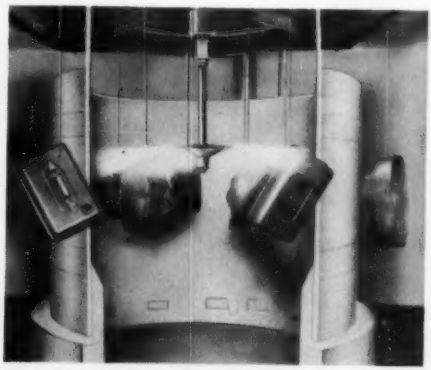

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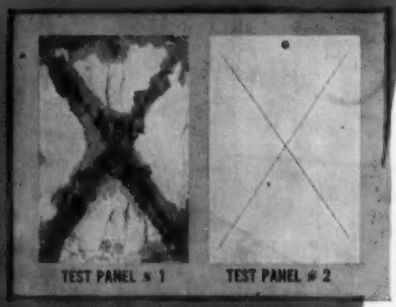
MEMO TO MANAGEMENT



DETREX
Paintbond

Scribed panels illustrated above demonstrate effectiveness of exclusive DETREX Paintbond process in accelerated corrosion tests. Panel with ordinary finish shows excessive "creepage" or flaking at scratch lines after only 48 hours of salt spraying. Other panel, thoroughly protected with DETREX Paintbond, remains unaffected after 250-hour salt spray test!

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INTERPLANT CORRESPONDEN

From the desk of the

PRODUCTION MANAGER

You may not have noticed it from their outward appearance—but take it from me, the Detrex Paintbond process has really improved the finish on our refrigerators.

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